

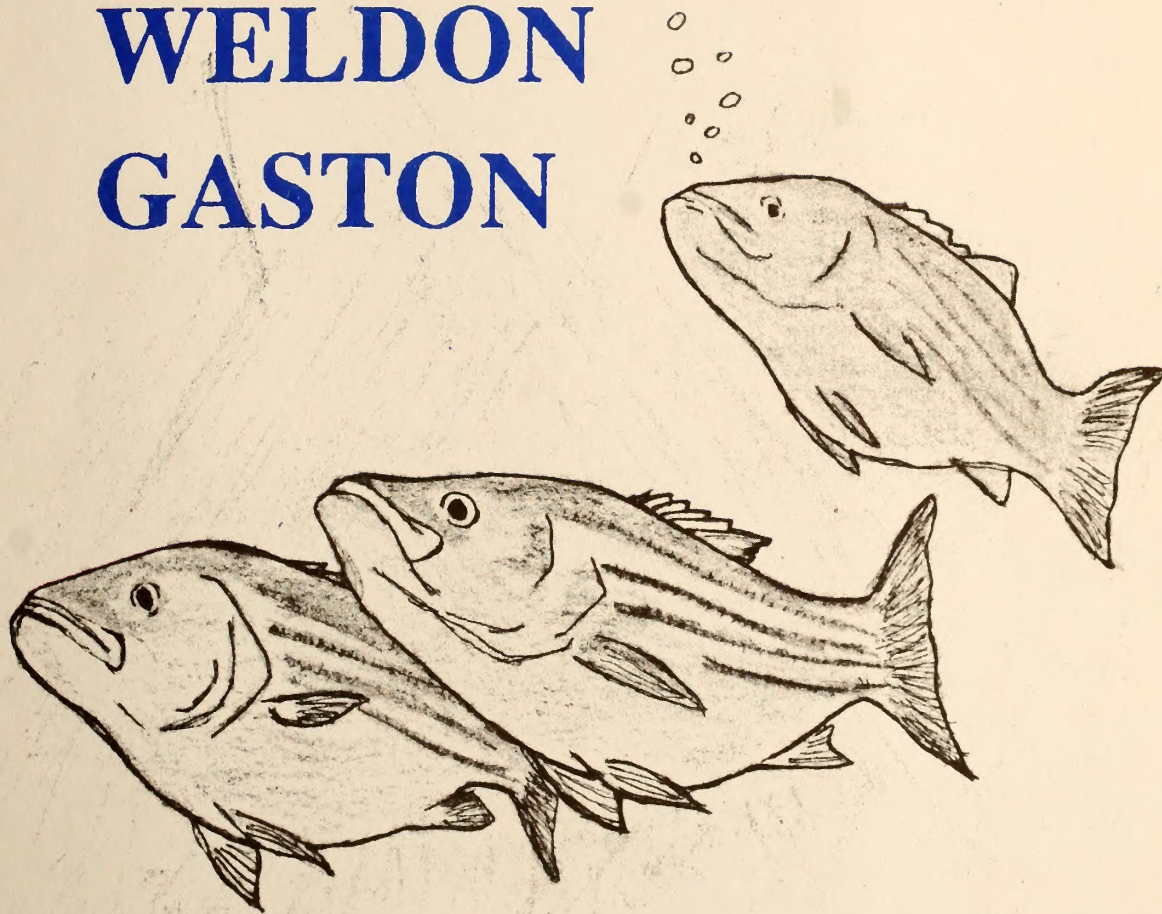
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North Carolina Department of Transportation  
Statewide Planning Branch  
Small Urban Planning Unit

**THOROUGHFARE PLAN**  
**FOR**

**ROANOKE RAPIDS**  
**WELDON**  
**GASTON**



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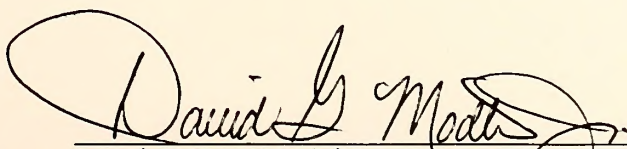
**THOROUGHFARE PLAN**  
**FOR**  
**ROANOKE RAPIDS-WELDON-GASTON, NORTH CAROLINA**

Prepared by the:

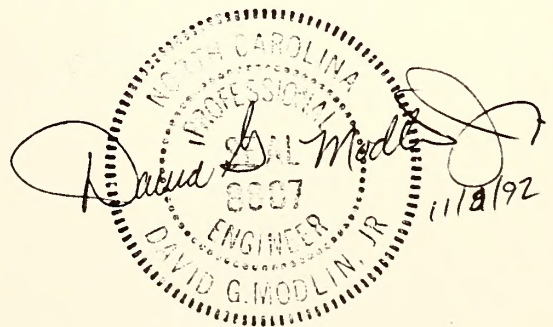
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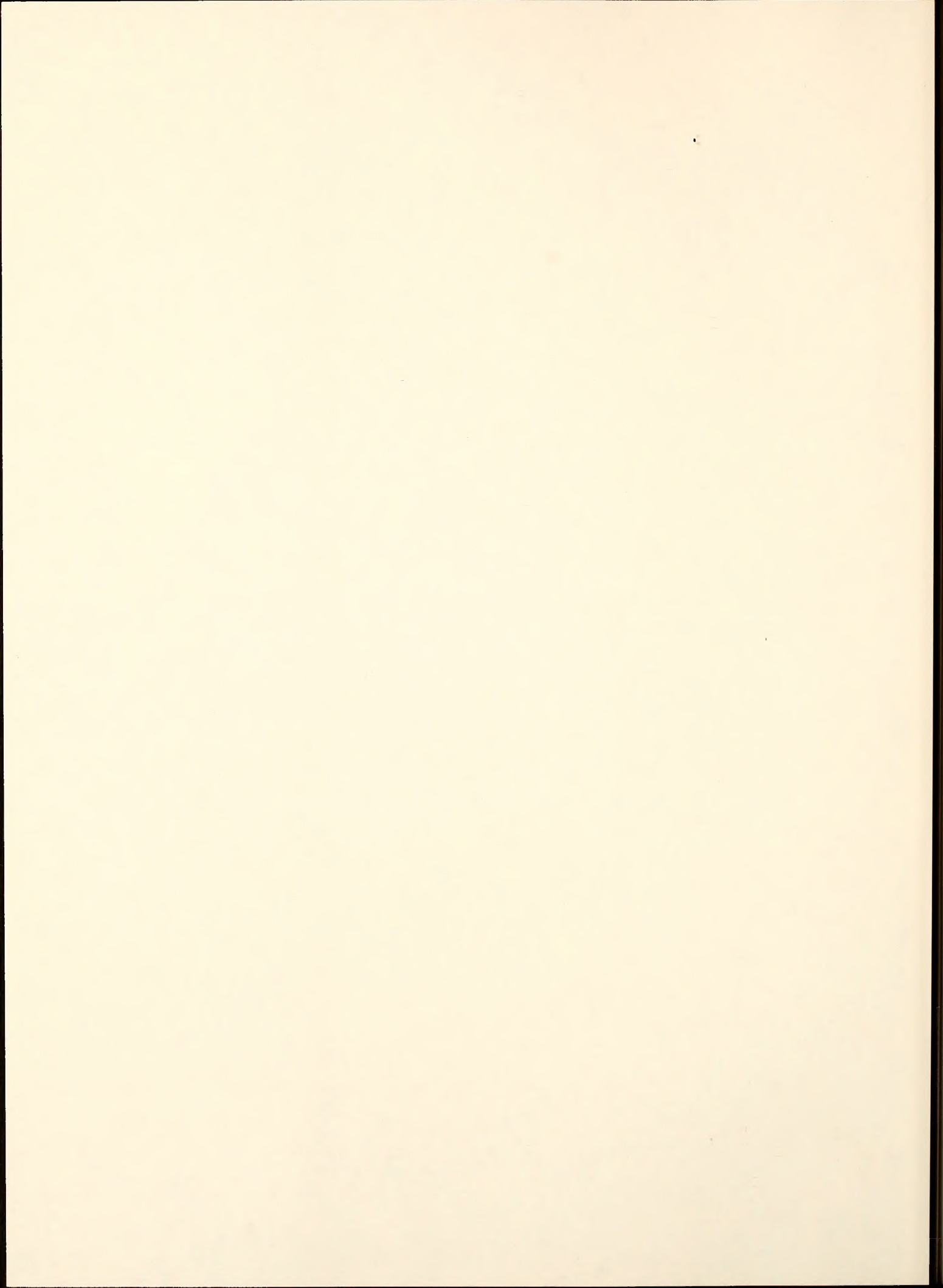
In Cooperation with:

The City of Roanoke Rapids  
The Town of Weldon  
The Town of Gaston  
The Federal Highway Administration  
U. S. Department of Transportation



David G. Modlin, Jr., Ph. D., P. E.  
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## ACKNOWLEDGMENTS

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1. The purpose of this study is to determine the effect of the new policy on the economy. The study will be conducted in three phases. The first phase will be to collect data on the economy before the policy was implemented. The second phase will be to collect data on the economy after the policy was implemented. The third phase will be to analyze the data and draw conclusions.

100 copies of this report will be distributed to all members of the committee. The report will be available to the public in 1990.

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## I. INTRODUCTION

This report is an update of the previous Roanoke Rapids-Weldon-Gaston Thoroughfare plan dated May, 1978. This update was initiated in July, 1990, and culminated in the mutual adoption of an updated Roanoke Rapids - Weldon -Gaston Thoroughfare Plan, map dated May 8, 1992 (See Figure 9).

The purpose of this study was to re-examine the present and future transportation needs of the area, and from this derive a revised Thoroughfare Plan. The system of thoroughfares proposed was developed following the principles of thoroughfare planning outlined in Chapter II of this report.

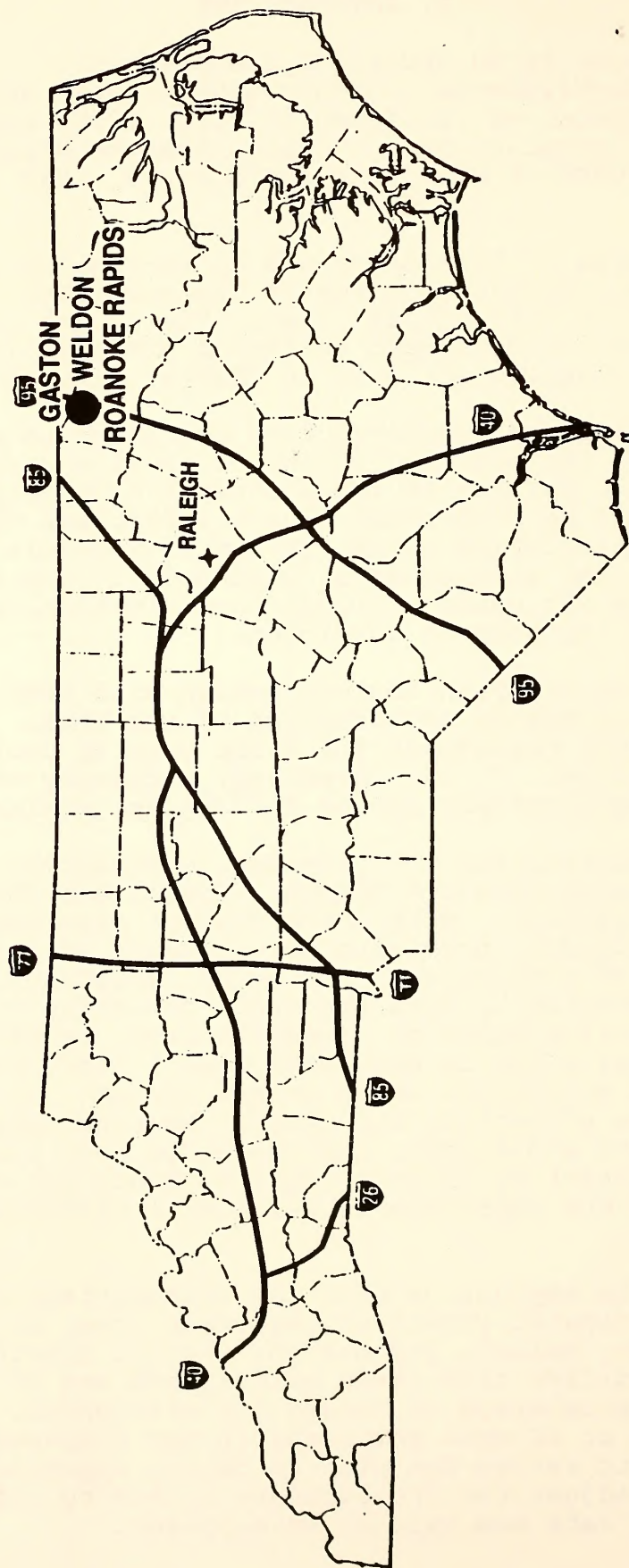
The recommended cross-sections are based on existing conditions and the expected volume of traffic in the design year. Before a project is implemented a more detailed evaluation will be performed. Every effort was made to use as much of the existing street system as possible in order to minimize cost and environmental disruption. The location of new facilities was based on field investigation, existing land use, and topographic conditions.

Initiative for plan implementation will rest largely with the policy boards and citizens of the area. The scope of highway needs throughout the State greatly outweighs the available funding. It is, therefore, necessary that the local areas aggressively pursue funding for desired projects.

Responsibility for the proposed construction must be shared by Roanoke Rapids - Weldon - Gaston and the N. C. Division of Highways. With the different governmental agencies involved in providing the elements of the plan, coordination of activities is of prime importance. The plan is formally adopted by both the local governing bodies and the North Carolina Board of Transportation, to serve as a mutual official guide in providing a well coordinated, adequate, and economical major street system. In order for the plan to be effective, the City of Roanoke Rapids, the Towns of Weldon and Gaston, and the State must procure in advance or protect by various legal controls the right-of-way necessary for the improvements which will ultimately be required.

It must be emphasized that the Thoroughfare Plan was based on anticipated growth of the urban area, as provided by Roanoke Rapids, Weldon, and Gaston. Actual growth rates and patterns may differ from those anticipated and it may become necessary to accelerate or retard the development of thoroughfares or to make revisions in the proposed plan. It is desirable to review the plan in detail approximately every ten years to adjust the thoroughfare system to reflect the actual growth rate and type of development.

# GEOGRAPHIC LOCATION



ROANOKE RAPIDS-WELDON  
GASTON

NORTH CAROLINA

FIGURE 1

## II. THOROUGHFARE PLANNING PRINCIPLES

### Objectives

Typically, the urban street system occupies 25 to 30 percent of the total developed land in an urban area. Since the system is permanent and expensive to build and maintain, much care and foresight are needed in its development. Thoroughfare planning is the process public officials use to assure the development of the most appropriate street system that will meet existing and future travel desires within the urban area.

The primary aim of a thoroughfare plan is to guide the development of the urban street system in a manner consistent with the changing traffic patterns. A thoroughfare plan will enable street improvements to be made as traffic demands increase, and it helps eliminate unnecessary improvements, so needless expense can be averted. By developing the urban street system to keep pace with increasing traffic demands, a maximum utilization of the system can be attained, requiring a minimum amount of land for street purposes. In addition to providing for traffic needs the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future population, commercial and industrial development affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

1. providing for the orderly development of an adequate major street system as land development occurs,
2. reducing travel and transportation costs,
3. reducing the cost of major street improvements to the public through the coordination of the street system with private action,
4. enabling private interests to plan their actions, improvements, and development with full knowledge of public intent,
5. minimizing disruption and displacement of people and businesses through long range advance planning for major street improvements,
6. reducing environmental impacts, such as air pollution, resulting from transportation, and
7. increasing travel safety.

Thoroughfare planning objectives are achieved through both improving the operational efficiency of thoroughfares, and improving the system efficiency through system coordination and layout.

### **Operational Efficiency**

A street's operational efficiency is improved by increasing the capability of the street to carry more vehicular traffic and people. In terms of vehicular traffic, a street's capacity is defined by the maximum number of vehicles which can pass a given point on a roadway during a given time period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, nature of traffic, and weather.

Physical ways to improve vehicular capacity include street widening, intersection improvements, improving vertical and horizontal alignment, and eliminating roadside obstacles. For example widening of a street from two to four lanes more than doubles the capacity of the street by providing additional maneuverability for traffic. This reduces the impedances to traffic flow caused by slow moving or turning vehicles and the adverse effects of horizontal and vertical alignments.

Operational ways to improve street capacity include:

1. Control of access -- a roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with identical lane width and number.
2. Parking removal -- Increases capacity by providing additional street width for traffic flow and reducing friction to flow caused by parking and unparking vehicles.
3. One-way operation -- The capacity of a street can sometimes be increased 20-50%, depending upon turning movements and overall street width, by initiating one-way traffic operations. One-way streets can also improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.
4. Reversible lane -- Reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur during peak periods.
5. Signal phasing and coordination -- Uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation. Altering travel demand is a third way to improve the

efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

1. Encourage people to form carpools and vanpools for journeys to work and other trip purposes. This reduces the number of vehicles on the roadway and raises the people carrying capability of the street system.
2. Encourage the use of transit and bicycle modes.
3. Encourage industries, businesses, and institutions to stagger work hours or establish variable work hours for employees. This will spread peak travel over a longer time period and thus reduce peak hour demand.
4. Plan and encourage land use development or redevelopment in a more travel efficient manner.

### **System Efficiency**

Another means for altering travel demand is the development of a more efficient system of streets that will better serve travel desires. A more efficient system can reduce travel distances, time, and cost to the user. Improvements in system efficiency can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

### **Functional Classification**

Streets perform two primary functions -- traffic service and land service, which when combined, are basically incompatible. The conflict is not serious if both traffic and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely used abutting property leads to intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets which permits travel from origins to destinations with directness, ease, and safety. Different streets in the system are designed and called on to perform specific functions, thus minimizing the traffic and land service conflict. Streets are categorized as to function as local access streets, minor thoroughfares, or major thoroughfares.

**Local Access Streets** provide access to abutting property. They are not intended to carry heavy volumes of traffic and should be located such that only traffic with origins and destinations of the streets could be served. Local streets may be further classified as either

residential, commercial, and/or industrial depending upon the type of land use which the serve.

**Minor Thoroughfares** are more important streets on the city system. They collect traffic from local access streets and carry it to the major thoroughfares. They may in some instances supplement the major thoroughfare system by facilitating minor through traffic movements. A third function that may be performed is that of providing access to abutting property. They should be designed to serve limited areas so that their development as major thoroughfares will be prevented.

**Major Thoroughfares** are the primary traffic arteries of the city. Their function is to move intra-city and inter-city traffic. The streets which comprise the major thoroughfare system may also serve abutting property; however, their principle function is to carry traffic. They should not be bordered by uncontrolled strip development because such development significantly lowers the capacity of the thoroughfare to carry traffic and each driveway is a danger and impediment to traffic flow. Major thoroughfares may range from a two-lane street carrying minor traffic volumes to major expressways with four or more traffic lanes. Parking normally should not be permitted on major thoroughfares.

### **Idealized Major Thoroughfare System**

A coordinated system of major thoroughfares forms the basic framework of the urban street system. A major thoroughfare system which is most adaptable to desire lines of travel within an urban area is the radial-loop system. It permits movement between various areas of the city with maximum directness. This system consists of several functional elements--radial streets, crosstown streets, loop system streets, and bypasses (Figure 1A).

**Radial streets** provide for traffic movement between points located on the outskirts of the city and the central area. This is a major traffic movement in most cities and the economic strength of the central business district depends upon the adequacy of this type of thoroughfare.

If all radial streets crossed in the central area, an intolerable congestion problem would result. To avoid this problem, it is very important to have a system of crosstown streets which form a loop around the central business district. This system allows traffic moving from origins on

# IDEALIZED THOROUGHFARE PLAN

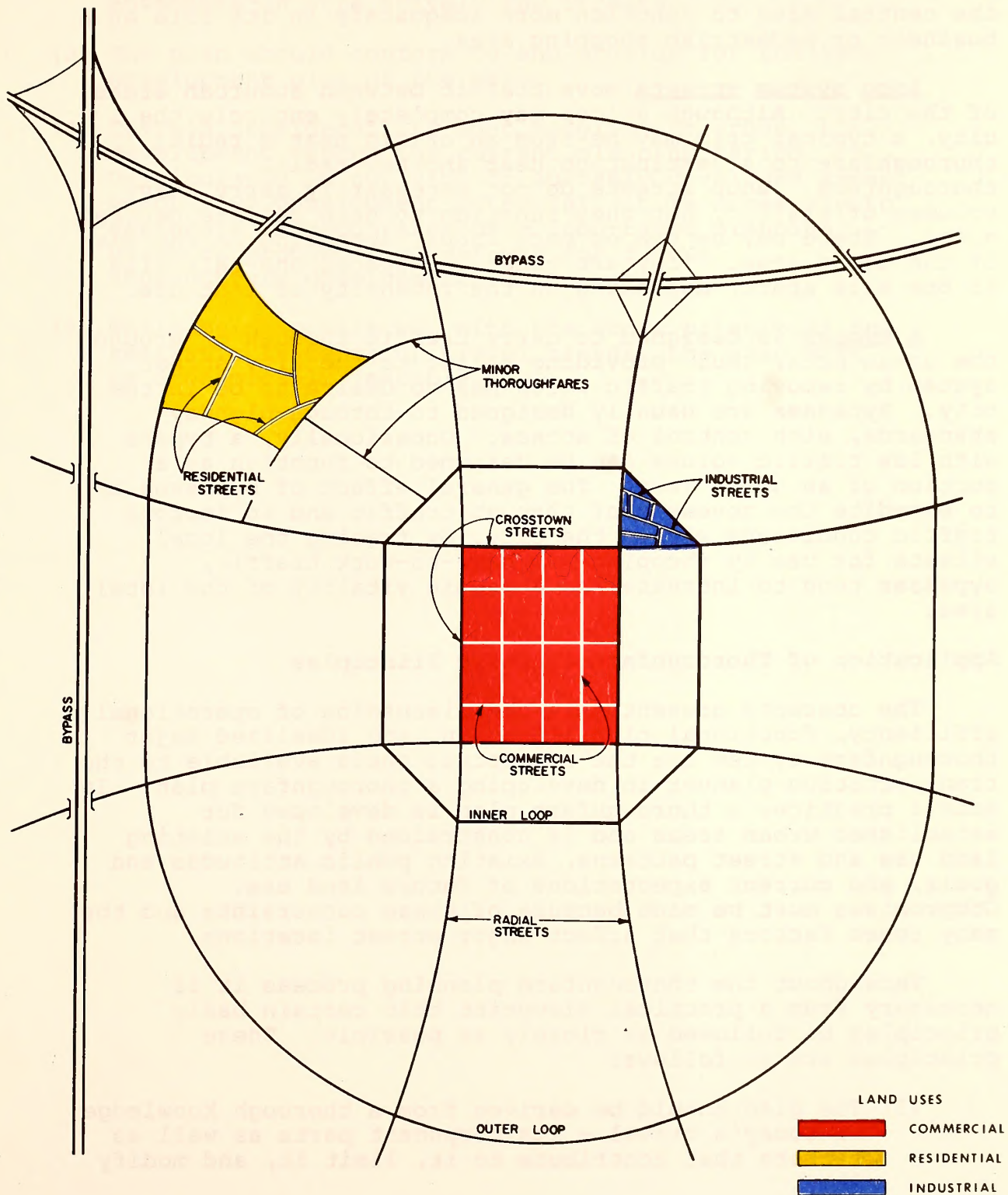


FIGURE 2

one side of the central area to destinations on the other side to follow the area's border. It also allows central area traffic to circle and then enter the area near a given destination. The effect of a good crosstown system is to free the central area of crosstown traffic, thus permitting the central area to function more adequately in its role as a business or pedestrian shopping area.

**Loop system streets** move traffic between suburban areas of the city. Although a loop may completely encircle the city, a typical trip may be from an origin near a radial thoroughfare to a destination near another radial thoroughfare. Loop streets do not necessarily carry heavy volumes of traffic, but they function to help relieve central areas. There may be one or more loops, depending on the size of the urban area. They are generally spaced one-half mile to one mile apart, depending on the intensity of land use.

**A bypass** is designed to carry traffic through or around the urban area, thus providing relief to the city street system by removing traffic which has no desire to be in the city. Bypasses are usually designed to through-highway standards, with control of access. Occasionally, a bypass with low traffic volume can be designed to function as a portion of an urban loop. The general effect of bypasses is to expedite the movement of through traffic and to improve traffic conditions within the city. By freeing the local streets for use by shopping and home-to-work traffic, bypasses tend to increase the economic vitality of the local area.

### **Application of Thoroughfare Planning Principles**

The concepts presented in the discussion of operational efficiency, functional classification, and idealized major thoroughfare system are the conceptual tools available to the transportation planner in developing a thoroughfare plan. In actual practice, a thoroughfare plan is developed for established urban areas and is constrained by the existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these constraints and the many other factors that affect major street locations.

Throughout the thoroughfare planning process it is necessary from a practical viewpoint that certain basic principles be followed as closely as possible. These principles are as follows:

- (1) The plan should be derived from a thorough knowledge of today's travel - its component parts as well as factors that contribute to it, limit it, and modify it.

- (2) Traffic demands must be sufficient to warrant the designation and development of each major street. The thoroughfare plan should be designed to accommodate a large portion of all major traffic movements on a relatively few streets.
- (3) The plan should conform to and provide for the land development plan of the area.
- (4) Certain considerations must be given to urban development beyond the current planning period. Particularly in outlying or sparsely developed areas which have development potential, it is necessary to designate thoroughfares on a long-range planning basis to protect right-of-way for future thoroughfare development.
- (5) While being consistent with the above principles and realistic in terms of travel trends, the plan must be economically feasible.



### III. EXISTING AND PROJECTED CONDITIONS

#### The Planning Area - Historic Background

In about 1745, Daniel Weldon bought a tract of farm land from Marmaduke Kimbrough, and his son planted on it an orchard so fine that his place became widely known as Weldon's Orchard. Located just below the fall line, at an altitude of 77 feet, it was the head of navigation on the Roanoke River, and for a while was called Weldon Landing before being shortened to just Weldon.

The modern history of Roanoke Rapids began in the 1870's. The City owes its beginning to the red, tumbling waters of the Roanoke River and to the men who subdued those waters and trained them to work for mankind. Major Emry, a prosperous merchant and farmer of Weldon had long been interested in the water power of the river as suggested by the locks in the old Roanoke Navigation Company canal. As the south began to recover from the ravages of the War Between the States, Major Emry began to study the possibilities for increased industrialization of this section of the State. With this in mind he bought the land lying along the river by the "Great Falls" and succeeded in interesting among others C. M. Cohen and W. M. Habiston of Petersburg in the development of the water power there.

They formed the Great Falls Waterpower, Manufacturing and Improvement Company, a title they kept until it was changed to Roanoke Rapids Power Company in 1895, and work started about April, 1891, on the actual construction of the canal. The work on the dam and canal was completed in late 1892 or early 1893.

In December, 1893, John Armstrong Chaloner (Chanler), scion of the wealthy Astor Family, visited Great Falls with the idea in mind of establishing an industry there. Negotiations with the power company were made and Chaloner and his associates built the first industrial building in the area. This was the old spinning (knitting) mill, chartered under the name "United Industrial Company" which turned out yarns using the old type spinning mules.

For the workers in the spinning mill, Chaloner built about thirty houses on Hamilton, Washington, and Jefferson Streets between First and Forth Streets. This section is today known by old residents as "Old Town."

By the year 1895, Major Emry had seen the first chapter of his vision for a city complete. Now he wanted to see full utilization of the river's power and development of further industries to give more people work and to produce more of

the world's commodities. By that year he had sold the idea of industrialization to C. M. Cohen and W. M. Habliston of Petersburg and to W. S. Parker of Henderson.

These men, Major Emry, Dr. D. B. Zollicoffer, and the Estate of E. I. Thomas formed the Roanoke Mills Company and were incorporated in 1895, with a capital stock of not less than \$50,000, and not over \$500,000. The original products were flannels and towels.

Roanoke Mills built "New Town," that section west of Roanoke Avenue between First and Fourth Streets, as the mill was being erected along the river bank. It is said that in the fall of 1896 cotton was picked out of the way of carpenters along lower Jackson, Madison, and Monroe streets.

By 1897, the people of the two villages felt they needed the protection of an incorporated town. An act, therefore, was put through the General Assembly of that year for incorporation and "Old Town" and "New Town" became Roanoke Rapids. The name "Great Falls" was dropped because it was decided the title did not rightly name the rapids in the river near the city.

The Town of Gaston was not always in its present location. The site of Old Gaston is now beneath the waters of Roanoke Rapids dam, but modern Gaston is Northampton County's largest town. Located just across the Roanoke River from Roanoke Rapids, Gaston has become a residential suburb for the workers of Roanoke Rapids.

### **Factors Affecting Transportation**

The factors of population, economy and land use play a significant role in determining the transportation needs of a city. Examination of these factors helps to explain historic travel patterns and lays the groundwork for thoroughfare planning.

In order to formulate an adequate design year 2020 thoroughfare plan, reliable forecasts of future travel characteristics must be achieved. The factors of population, vehicle usage trends, economy and land use play a significant role in determining the transportation need of the area, and these factors must be carefully analyzed. Additional items may include the effects of legal controls such as subdivision regulations and zoning ordinances, availability of public utilities and physical features of the area.

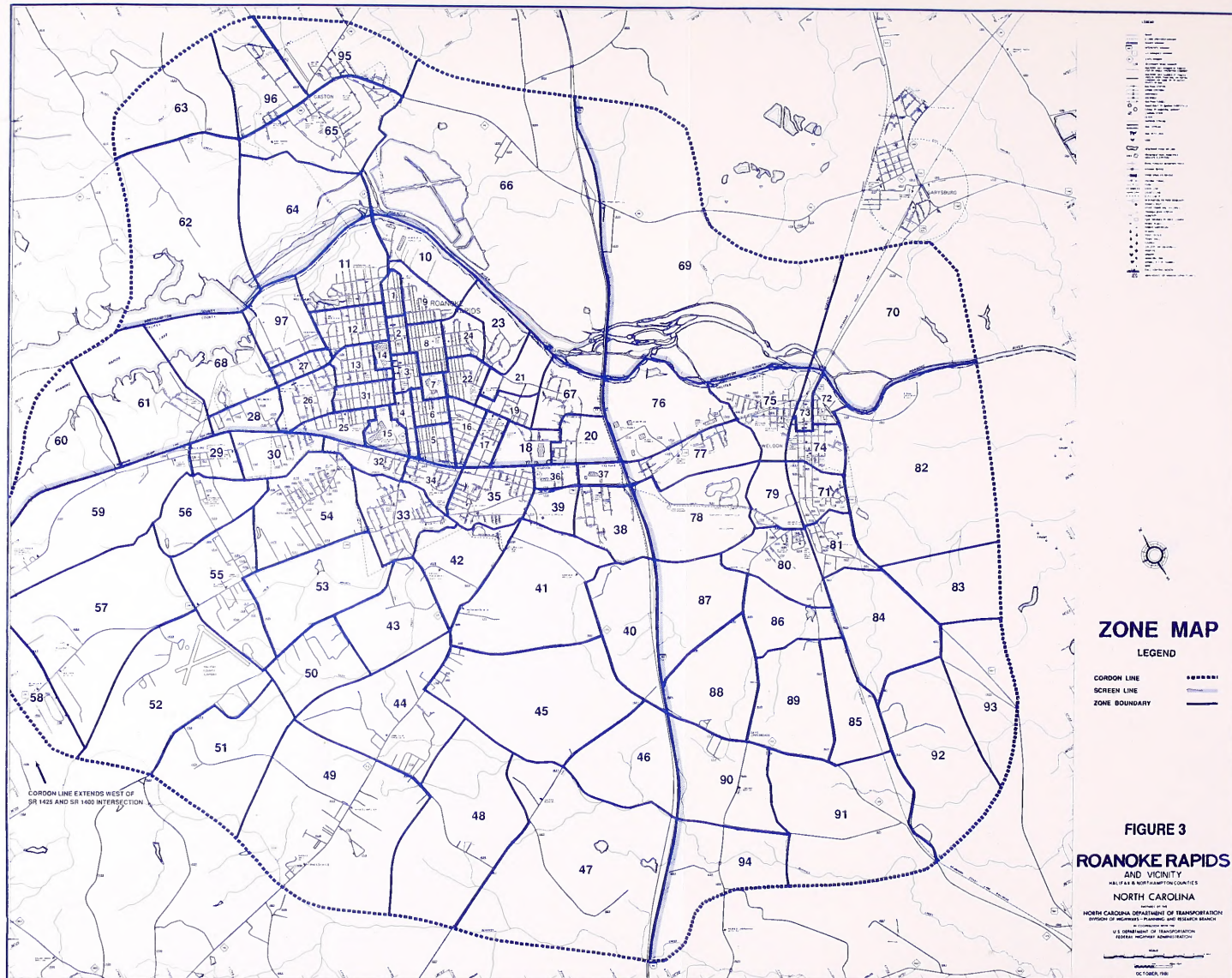
The first step in the development of the thoroughfare plan is to define the planning period and the planning area. The planning period is typically on the order of 20 years. The base year for the Roanoke Rapids - Weldon - Gaston study was 1990, and the year 2020 was chosen to be the endpoint of

the study period (30 years). The planning area is generally the limits to which some urbanization is expected to occur during the planning period. Due to heavy interdependence of Roanoke Rapids, Weldon and Gaston , the planning area includes the rural areas between them. The planning area is then subdivided into traffic analysis zones. Figure 3 shows the planning area boundary and zones.











# ROANOKE RAPIDS AND VICINITY

NORTH CAROLINA

FIGURE 2

ROANOKE RAPIDS AND VICINITY  
NORTH CAROLINA  
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## Population

Travel is directly related to population. The volume of traffic on any given section of roadway is closely related to the size and distribution of the population which it serves. Because of this relationship, one of the basic steps in planning a transportation system is an in depth population study. The most important population estimate for development of the thoroughfare plan is that of the planning area. Even though government census data is not available for the transportation planning area, data is available from a Department of Transportation study completed 17 years ago for this area.

In the 1978 Roanoke Rapids - Weldon - Gaston Transportation Plan, the planning area was separated into 3 distinct regions surrounding Roanoke Rapids, Gaston and Weldon. The 1990 zone numbers are not exactly the same as in 1973 but the corresponding areas are easily discernable. For the 1990 study Gaston was given zones 62-66 and zones 95 and 96. Weldon was given zones 69-87 with the exception of a portion of zone 76 next to I-95 that is within the planning boundary of Roanoke Rapids. Roanoke Rapids was given the remaining zones within the Transportation Planning Area. Population data is listed according to these zones in Table 1.

In the 1973 study, the planning area population estimate used for development of the thoroughfare plan was from an individual dwelling unit (DU) count and a persons per DU ratio from the 1970 census. Housing units numbered 8,596 and the persons per DU was given as 3.19. Multiplying the two gives the a planning area population of 27,419.

At the time of this study person per household data was not yet available for 1990. Therefore, 1980 census data was used to determine the persons per DU ratio for the planning area. The 1980 persons per DU ratio in Northampton and Halifax Counties were 2.74 and 2.76 respectively. Roanoke Rapids had a persons per DU ratio of 2.65 in 1980. Based on these figures 2.5 persons per DU seems to be an acceptable number for 1990. Using 2.5 persons per dwelling unit for the Roanoke Rapids-Weldon-Gaston planning area, and multiplying by 11,937 housing units from the 1990 planning area housing survey, a population of 29,843 is calculated for the year 1990.

To project the planning area population to the design year a population growth rate of 5.11% per decade was calculated based on the housing information collected in 1973 and 1990 for the planning area. This growth rate was then applied to the present transportation planning area to estimate a population of 34,655 for the design year of 2020 and populations of 31,371 and 32,970 persons in the years 2000 and 2010 respectively. To convert this figure back to future housing, a 2.48, 2.45 and 2.4 persons per dwelling unit ratio is used for 2000, 2010 and 2020 respectively.

1973 and 1990 Population estimates as well as projections for the years 2000, 2010 and 2020 are shown in Table 1, for the Roanoke Rapids, Gaston and Weldon areas. This is also graphically illustrated in Figure 4.

**TABLE 1**  
**Population Projections for the Roanoke Rapids Planning Area**

	Roanoke Rapids Planning		Gaston	Weldon	Northampton	Halifax
<u>Year</u>	<u>Area</u>	<u>Area</u>	<u>Area</u>	<u>County</u>	<u>County</u>	<u>Area</u>
1973	21,400	1,668	4,351	24,009	53,884	27,419
1990	24,768	1,675	3,400	20,798	55,516	29,843
2000	25,787	2,010	3,574	19,617	56,552	31,371
2010	26,801	2,412	3,757	18,212	56,806	32,970
2020	27,811	2,895	3,949	16,729	56,820	34,655

# POPULATION TRENDS FOR THE ROANOKE RAPIDS PLANNING AREA

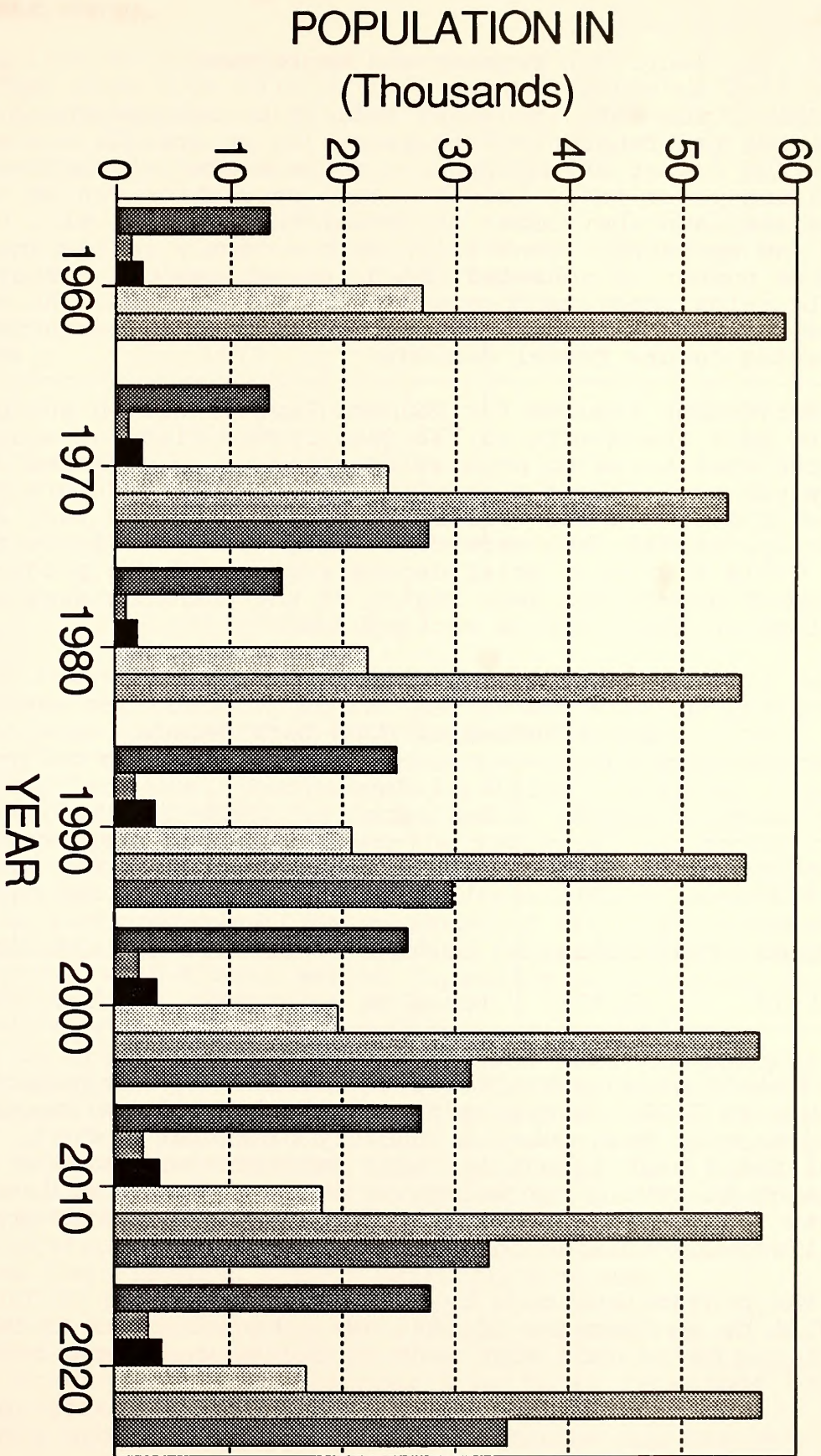


FIGURE 4

## Economy and Employment

One of the more important factors to be considered in estimating the future traffic growth of an area is its economic base. The number of employers and the employee's income or purchasing power influences how much population can be supported in the area and the number of motor vehicles that will be locally owned and operated. Generally, as the family income increases so does the number of vehicles owned, as well as the number of vehicle trips generated per day by each household. An accurate projection of the future economy of the area is essential to estimating future travel demand.

Employment figures for Roanoke Rapids, Weldon and Gaston show that in 1990 there were 13,772 jobs in the Planning Area. With this the employment to population ratio was determined to be 0.46. Employment projections made with this ratio and future population projections show there will be 15,997 jobs in the year 2020. Similarly, 15,219 jobs were calculated to be available in the year 2010. Table 2 gives a brief decade summary of the projected employment growth for each region of the planning area as described in the previous section.

**Table 2**

Total Number of Jobs Each Decade					
Location	1990	% of Total Employment	2000	2010	2020
Gaston Area	544	3.949%	572	601	632
Weldon Area	1,794	13.025%	1,886	1,982	2,083
Roanoke Rapids Area	<u>11,436</u>	<u>83.026%</u>	<u>12,024</u>	<u>12,636</u>	<u>13,282</u>
Totals	13,774	100.000%	14,482	15,219	15,997

Table 2 shows a projected increase of 88 new jobs for Gaston by the year 2020. Gaston officials feel as though service jobs will grow more than jobs in industry over this period. A consolidated high school is under construction and will be completed in 1991. For Weldon it shows a projected increase of 289 new jobs by the design year 2020. Weldon should grow more in retail/service related jobs than in industry.

The projections made by Roanoke Rapids shown in Table 2 show there will be an increase of 1846 new jobs available in 2020. When allocating these jobs most went to industry or service/retail related jobs.

A comparison by percentage of five major job types available in the planning area from 1973 to 1990 and projected to 2010 and 2020 shows no significant shift (See Table 3). However, there is a general decline in industrial jobs and a corresponding rise in retail, special retail and service related jobs.

**Table 3**

<b>Percentages of Job Types Available for Planning Area</b>				
<b>Job Type</b>	<b>1973</b>	<b>1990</b>	<b>2010</b>	<b>2020</b>
Industry	55.1%	40.2%	38.6%	37.9%
Retail	16.2%	16.8%	17.7%	18.2%
Special Retail	6.9%	10.4%	10.5%	10.6%
Service	12.7	28.0%	28.5%	28.6%
Office	9.1%	4.5%	4.7%	4.7%

### **Land Use**

Land use refers to the physical patterns of activities and functions within the planning area. Nearly all traffic problems in a specific area are relative to the area's land use. The amount of traffic on a particular street is very closely related to its adjacent land use. For example, a large industrial plant might be the cause of congestion during shift change hours as its workers come and go. However during the remainder of the day little, if any, problems might occur. The spatial distribution of different types of land use (sometimes referred to as traffic generators) is the predominant determinant of when, where, and why congestion occurs. The attraction between different land uses and their association with travel varies depending on the size, type, intensity, and spatial separation of each.

For use in transportation planning, land uses are grouped into four categories: (1) Residential - all land devoted to the housing of people with the exception of hotels and motels; (2) Commercial - all land devoted to retail trade including consumer and business services and offices; (3) Industrial - all land devoted to manufacturing, storage, warehousing, and transportation of products; and (4) Public - all land devoted to social, religious, educational, cultural, and political activities. Figure 5 shows the Planning Area's existing land use.

Anticipated future land use is a logical extension of the present spatial distribution. Determination of where expected growth is to occur within the Planning Area facilitates the location of proposed thoroughfares. Areas of anticipated development and growth for Roanoke Rapids, Weldon and Gaston are:

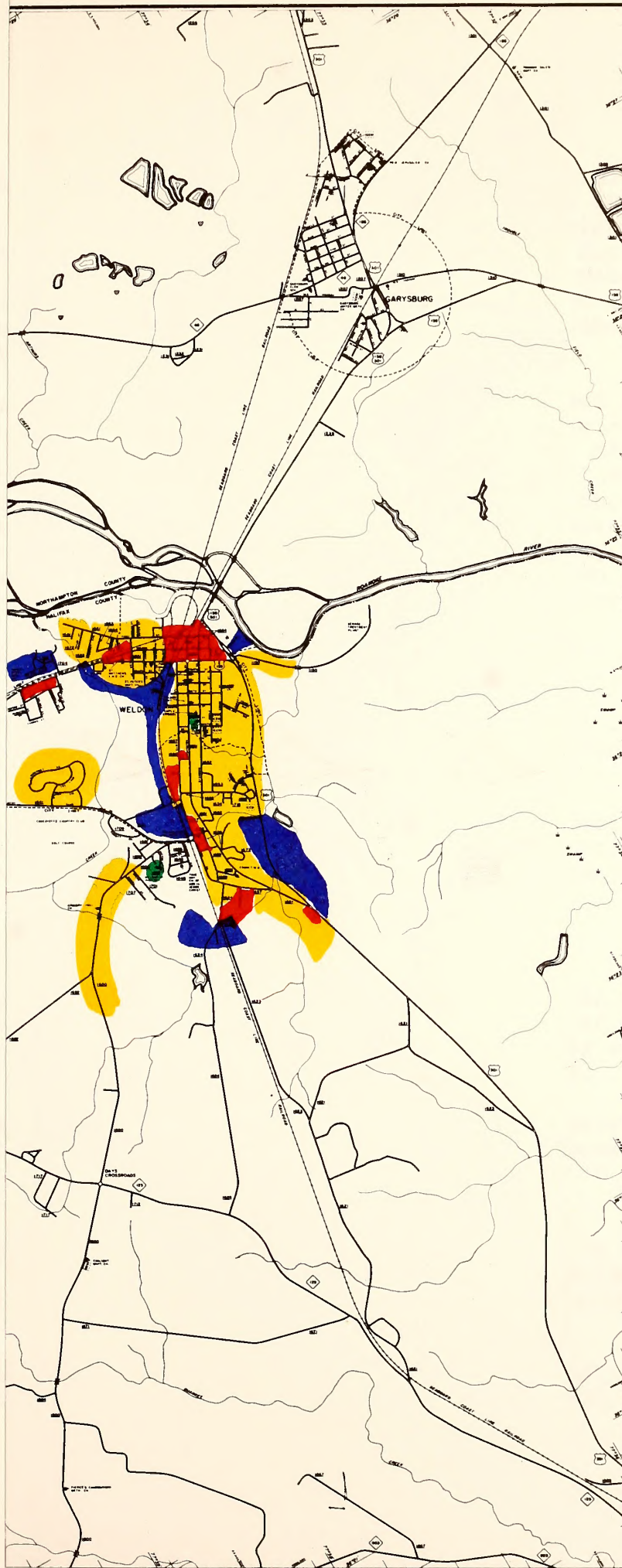
## Roanoke Rapids

Residential - A large amount of Roanoke Rapids residential land development is in a compact gridiron pattern near the center of the city. Within the city limits, the north side of Old Farm Road has some potential for new development. There is approximately 200 acres of land in this area that is available for development. However, due to the rough topography in this area access is limited. The location with the most potential for residential development is outside of the city limits south of Roanoke Rapids.

Commercial/Retail - The majority of commercial development in Roanoke Rapids is in three areas. The central business district along Roanoke Avenue, which is primarily offices and retail stores, along US 158, between I-95 and Tenth Street, and along Tenth Street from US 158 to Roanoke Avenue. Roanoke Rapids is the major shopping area for the Towns of Gaston and Weldon as well as for a large number of residents of both Halifax and Northampton Counties. Currently commercial development along US 158 and Tenth Street is causing traffic problems. It is suggested that no more driveway entrances be permitted along these routes. Instead new commercial development should be encouraged south of town on outparcels along NC 125. There should be increased emphasis placed on the need to plan these areas in order to eliminate congestion and traffic hazards.

Industrial - Several large manufacturing plants are located in two distinct areas of Roanoke Rapids (See Figure 5). On the north side of the City, along the Roanoke River, is the Champion Paper Plant. Scattered throughout the central business district, the Bibb Company has three plants. Also light industries which consist of light processing and assembly operations, building material yards, machinery yards, nurseries, warehouses, storage and salvage yards are dispersed throughout the City. Areas which have a higher concentration of such activity include Becker Industrial Park, the area north of Weldon Road and south of Seaboard Coast Line Railroad.

Public - Roanoke Rapids has a number of institutions for public use such as churches and community centers. The majority of these are concentrated along Roanoke Avenue and portions of Hamilton Street. Some facilities available for recreational use are the Ledgerwood Activity Center, Emry Park, Akers Field, Davis Athletic Complex, Kirkwood Community Center, Chaloner Park, Roanoke Rapids Canal Trail, Rochelle Park, and the Senior Citizen's Center.



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- LEGEND**
- RESIDENTIAL**
  - COMMERCIAL**
  - INDUSTRIAL**
  - PUBLIC**



## LAND USE MAP

**FIGURE 5**  
**ROANOKE RAPIDS**  
 AND VICINITY  
 HALIFAX & NORTHAMPTON COUNTIES  
 NORTH CAROLINA

PREPARED BY THE  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS - PLANNING AND RESEARCH BRANCH  
 IN COOPERATION WITH THE  
 U.S. DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION

SCALE  
 1" = 1 MILE  
 OCTOBER, 1961

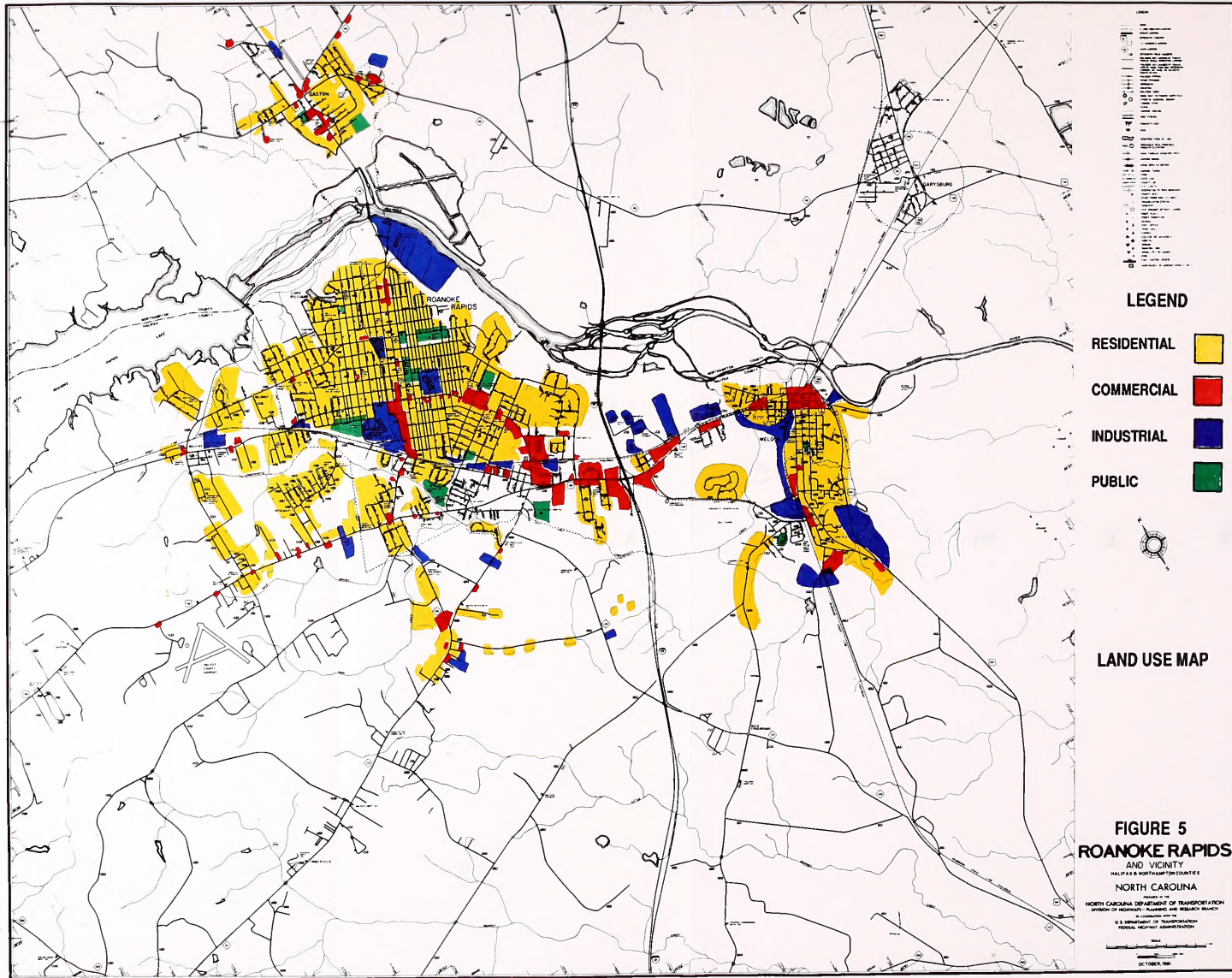
## Roanoke Rapids

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## **Weldon**

Residential - Most of the Weldon's residential development will occur outside of the town limits. The availability of water and wastewater facilities will determine the location and density of the residential development for the area. The area south of the town limits has the best potential for residential development. Most of the vacant land in the northern portion of the Town is in the Roanoke River's flood plain.

Commercial/Retail - Weldon's central business district consists of Second and Third Streets. These streets are devoted primarily to retail trade, business services and offices. Steps should be taken by the local merchants and the Town to provide sufficient parking and improve the overall appearance of the area. Future development is expected to be highway business type development along US 158. Emphasis should be placed on the need to plan this area in order to eliminate congestion and traffic hazards.

Industrial - Industrial development in Weldon is limited with most being located along US 158 on the east side of the Town. It is anticipated that future development will be in the existing industrial park located along Grace Drive (SR 1710). The planned extension of Becker Drive from Roanoke Rapids to this area should stimulate development.

Public - Weldon's educational facilities consist of Halifax Community College and Weldon High School. For recreation use there is the Chocoyotte Country Club and the Chocoyotte Fair Grounds located along Country Club Road.

## **Gaston**

Residential - Most residential development in Gaston is located on the south side of Town along NC 48. There is currently a large amount of undeveloped land within the town limits available for future residential use.

Commercial/Retail - Commercial and retail development in Gaston is extremely limited. Due to its close proximity to Roanoke Rapids most residents travel there to do their shopping.

Industrial - Gaston is a bedroom community to Roanoke Rapids with very little industrial development. Existing development is light industrial and future development is expected to continue as light industrial.

Public - Several churches and the construction of a new high school are some of Gaston's public facilities.



#### IV. TRAVEL FORECAST MODELS

While traffic volume counts on existing streets are useful in evaluating the ability of the current system to meet travel demands, they reveal little as to the actual travel desires (origins and destinations) of the motorist. For thoroughfare planning purposes, a comprehensive knowledge of the origins and destinations of existing traffic and estimated future traffic is essential.

The type, intensity, and location of the population and employment within an area largely determine the travel patterns. The method used to predict future travel involves the development of mathematical models relating population and employment to travel. Models are developed to (1) estimate trips produced (origins) and trips attracted (destinations) by traffic zones and (2) to estimate travel patterns between zones. Separate models are developed for the three basic types of trips: internal; internal-external; and through. **Internal trips** are defined as those trips which have both origin and destination inside the planning area. An **internal-external trip** is a trip which has one end inside the planning area and the other outside. **Through trips** are defined as those trips which travel through the area and have both origin and destination outside the study area.

The travel forecast models for the Roanoke Rapids-Weldon-Gaston area were developed on the basis of travel, employment and population data obtained for the base year 1990. The validity of the models was tested by comparing the traffic volumes computed by the models to traffic volume counts taken on the existing street system.

After travel forecast models have been calibrated so that they adequately duplicate travel, design year travel estimates are produced through the input of design year data on population and employment. The trip distribution models are sensitive to changes in the street system and variation will occur in the travel patterns as alternative future street plans are tested. A more detailed documentation of the travel forecast models is given in Appendix B. Table 4 gives a summary of travel data trends for the area.

Table 4

TRAVEL DATA SUMMARY		
Type	1990	2020
Average Daily Trips per DU	8.51	8.54
Internal Trips	90,476	112,328
Home Based Work	22,619	28,082
Other Home Based	47,952	59,534
Non-Home Based, internal	19,905	24,712
NHB secondary	16,803	38,872
Internal <--> External	43,352	84,609
Through Trips	55,416	163,636

---

Average Daily Trip/DU = the number of trips generated by dwelling units in the planning area divided by the total number of dwelling units.

## V. ANALYSIS OF THE EXISTING STREET SYSTEM

This chapter presents an analysis of the ability of the existing street system to serve the area's travel desires. Emphasis is placed not only on detecting the deficiencies, but on understanding their cause. Travel deficiencies may be localized and the result of substandard highway design, inadequate pavement width, or intersection controls. Alternately, the underlying problem may be caused by a system deficiency such as a need for a bypass, loop facility, construction of missing links, or additional radials.

### Existing Travel Patterns

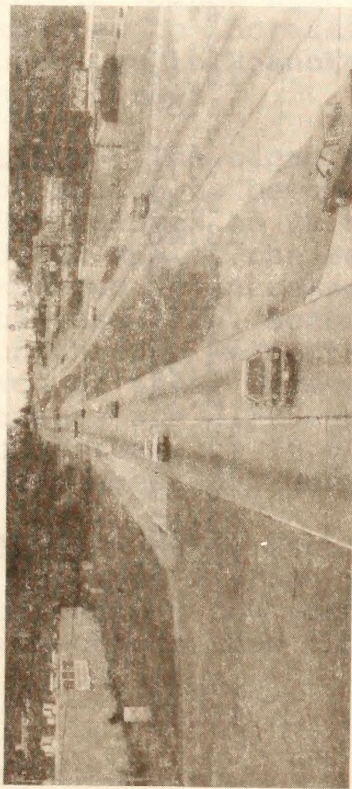
An indication of the adequacy of the existing street system is a comparison of traffic volumes versus the ability of the streets to move traffic. In an urban area, a street's ability to move traffic is generally controlled by the spacing of major intersections, access control, width of pavement, and the traffic control devices (such as signals) utilized.

**Capacity** is the maximum number of vehicles which has a "reasonable expectation" of passing over a given section of a roadway, during a given time period under prevailing roadway and traffic conditions. The relationship of traffic volumes to the capacity of the roadway will determine the **level of service (LOS)**. Six levels of service identify the range of possible conditions. Figure 6 shows the levels of congestion associated with the various levels of service. Table 5 gives a brief description of each LOS in accordance with the 1985 Highway Capacity Manual.

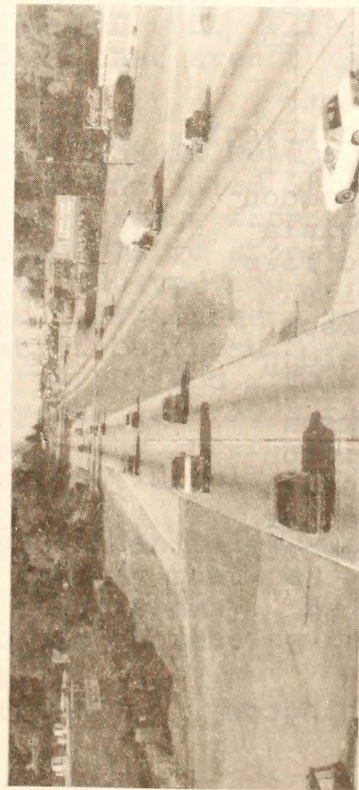
The recommended improvements and overall design of the Thoroughfare Plan were based on achieving a minimum of LOS D on existing facilities, and LOS C on new facilities. LOS D is considered the "**practical capacity**" of a facility, or that at which the public begins to express dissatisfaction.

Table 5

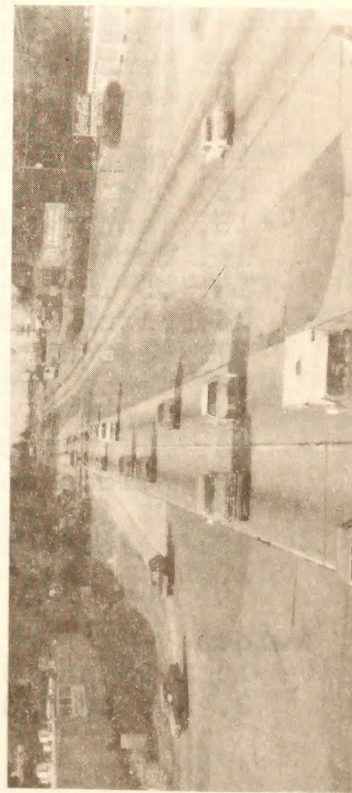
LEVEL OF SERVICE	
LOS A	- describes primarily free flow conditions. The motorist experiences a high level of physical and psychological comfort. The effects of minor incidents or breakdowns are easily absorbed. On an urban arterial, LOS A corresponds to a average travel speed of 25 to 35 mph.
LOS B	- also represents reasonably free flow conditions. The ability to maneuver within the traffic stream is only slightly restricted.
LOS C	- provides for stable operations, but flows approach the range in which small increases will cause substantial deterioration in service. Freedom to maneuver is noticeably restricted. Minor incidents may still be absorbed, but the local decline in service will be great. Queues may be expected to form behind any significant blockage.
LOS D	- borders on unstable flow. Small increases in flow can cause substantial deterioration in service. Freedom to maneuver is severely limited, and the driver experiences drastically reduced comfort levels. Minor incidents can be expected to create substantial queuing. On an urban arterial, LOS D corresponds to an average travel speed of 9 to 17 mph.
LOS E	- The boundary between LOS D and LOS E describes operation at <b>capacity</b> . Operations at this level are extremely unstable, because there are virtually no usable gaps in the traffic stream. Any disruption to the traffic stream, such as a vehicle entering from a ramp, or changing lanes, requires the following vehicles to give way to admit the vehicle. This condition establishes a disruption wave which propagates through the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate any disruption. Any incident can be expected to produce a serious breakdown with extensive queuing.
LOS F	- describes forced or breakdown flow. Such conditions generally exist within queues forming behind breakdown points.



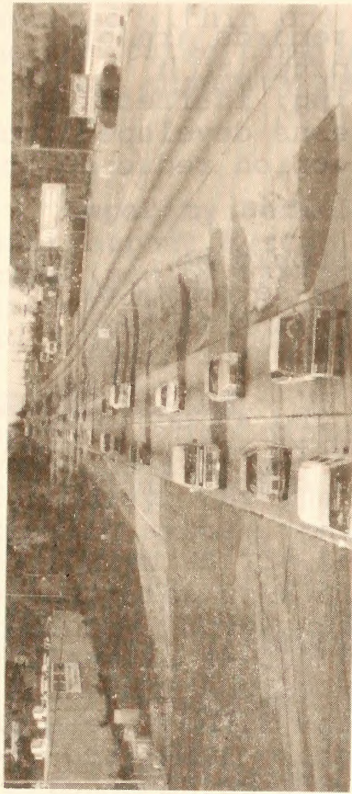
LEVEL OF SERVICE - A



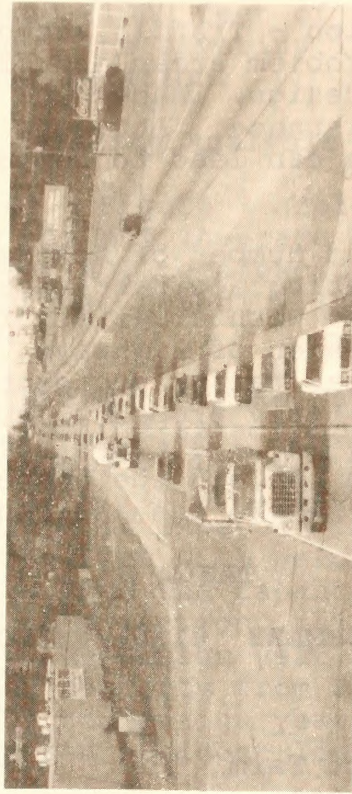
LEVEL OF SERVICE - B



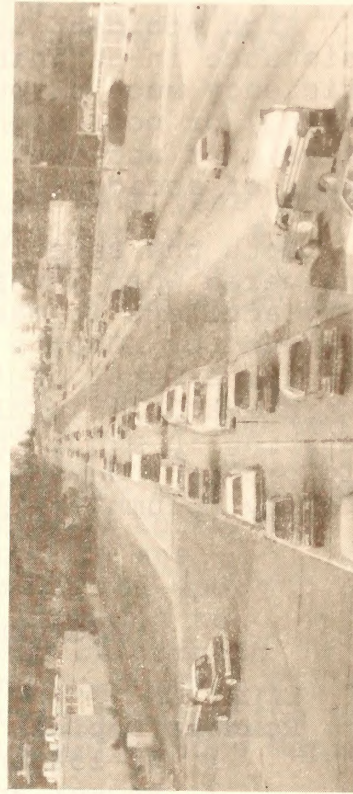
LEVEL OF SERVICE - C



LEVEL OF SERVICE - D



LEVEL OF SERVICE - E



LEVEL OF SERVICE - F

LEVELS OF SERVICE

## FIGURE 6

## Traffic Accidents

**High Accident Location** - Traffic accident records are of assistance in defining problem areas and often pinpoint a deficiency such as poor design, inadequate signing, ineffective parking, or poor sight distance. Accident patterns developed from analysis of accident data can lead to remedial action reducing the number of accidents.

Both the severity and number of accidents should be considered when investigating accident data. The severity of every accident is measured with a series of weighting factors developed by NCDOT's Division of Highways. In terms of these factors, a fatal or incapacitating accident is 47.7 times more severe than one involving only property damage, and an accident resulting in minor injury is 11.8 times more severe than one with only property damage. In table 6 the higher the number in the severity column the more severe the accidents.

**TABLE 6**

### ACCIDENT SUMMARY 01/01/89 TO 12/31/91

LOCATION	TOTAL	SEVERITY
<b>Roanoke Rapids</b>		
1. US 158 and Old Farm	43	11.09
2. Becker and Tenth	30	11.55
3. Tenth and Weldon	28	11.96
4. US 158 and Smith Church	22	18.21
5. US 158 and NC 48	25	10.76
6. US 158 and NC 125	21	14.76
7. Tenth and Hamilton	20	9.58
8. Tenth and Park	19	10.98
9. Georgia and Tenth	18	11.54
10. US 158 and Chockoyotte	16	7.20
11. Tenth and Marshall	16	7.79
12. Old Farm and Weldon	16	9.46
13. Tenth and Virginia	16	13.40
14. Becker and Old Farm	15	7.03
15. US 158 and Mullen	14	6.17
16. Fifth and Jackson	14	19.76
17. Georgia and Weldon	13	13.53
18. Tenth and Jefferson	13	5.18
19. Tenth and Jackson	13	10.75
20. Fifth and Hamilton	11	16.60
21. Weldon and Wheeler	11	8.37
22. US 158 and Wheeler	10	23.52
23. Roanoke and Seventh	10	12.73
<b>Weldon</b>		
1. I-95 and US 158	16	7.79
2. Second and Washington	11	10.87

The "Total" column indicates the total number of accidents reported within one hundred (100) feet of the intersection during the indicated time period. The severity listed is the average accident severity for that location.

### **Capacity Analysis**

**Capacity Deficiencies** - Figure 7 depicts the base year (1990) major street system, and the **ADT** (Average Daily Traffic). A comparison of the base year ADT to capacities reveals several streets near or over practical capacity (LOS D). These areas are highlighted, and include:

**ROANOKE RAPIDS** - US 158 through Roanoke Rapids is currently at capacity. The capacity from Old Farm Road to I-95 is 30,000 vpd (vehicles per day). Currently 34,000 vpd are using this section of roadway. By the year 2020, if no improvements are made to the existing system, this volume is expected to increase to 60,000 vpd. From US 158's intersection with Weldon Road to its intersection with Old Farm Road the capacity is 20,000 vpd. Presently 28,000 vpd use this section, this is expected to increase to 45,000 vpd by the design year. Based on current trends US 158 will be over capacity from Bolling Road (SR 1426) to the east side of Weldon by the design year. It is interesting to note that five of the top ten accident locations in Roanoke Rapids are found on US 158.

Tenth Street - From Weldon Road to Marshall Street the capacity of Tenth Street is 20,000 vpd. In 1990 the average daily traffic volume here was 18,000 vpd. By the year 2020 volumes are expected to increase to 25,000 vpd. Five of the top ten accident locations in Roanoke Rapids that aren't found on US 158 are along Tenth Street.

**WELDON** - The capacity of US 158 in Weldon from I-95 to where US 158 splits to become Second and Third Streets is 20,000 vpd. The 1990 volumes on this section range from 28,000 vpd at I-95 to 15,000 vpd at the Second and Third Street split. These are expected to increase to 51,000 vpd and 32,000 vpd respectively by the year 2020. Second and Third Streets are one-way streets that run through Weldon's central business district. The capacity of each of these streets is 14,000 vpd. The current volumes on these streets are 7,500 vpd. By the year 2020 these volumes are expected to increase to 16,000 vpd. The intersection of I-95 and US 158 is the highest accident location in Weldon.

**GASTON** - NC 46 from Gaston's central business district to I-95 is a two-lane 24-foot wide roadway that has a capacity of 13,000 vpd. Currently 5,000 vpd use this roadway. By the year 2020 projections show this volume increasing to 13,000 vpd.

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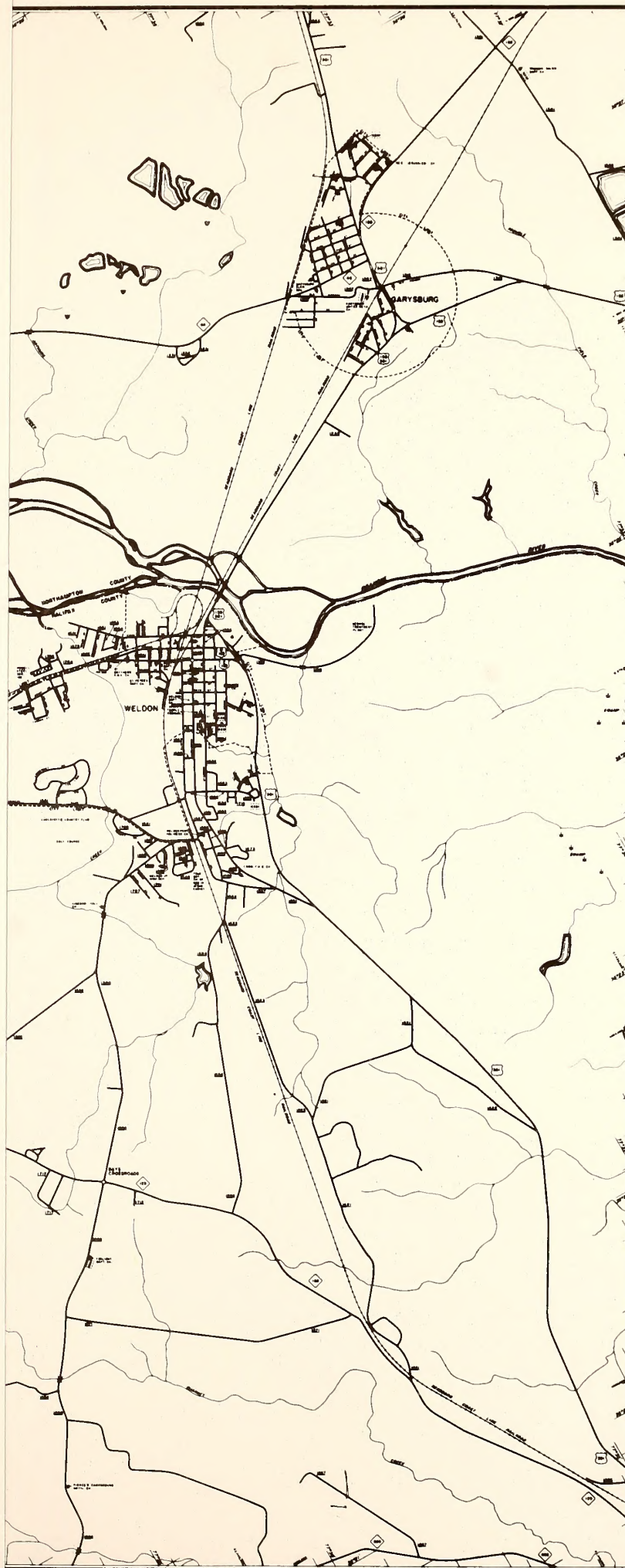
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## LEGEND

APPROACHING CAPACITY

OVER CAPACITY



## FIGURE 7

BASE YEAR VOLUMES  
COMPARED WITH CAPACITY

**ROANOKE RAPIDS**  
AND VICINITY

HALIFAX & NORTHAMPTON COUNTIES

NORTH CAROLINA

PREPARED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS - PLANNING AND RESEARCH BRANCH  
IN COOPERATION WITH THE  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION



OCTOBER, 1961

The first of these is the fact that the  
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has been passed on to the next generation  
of the family.

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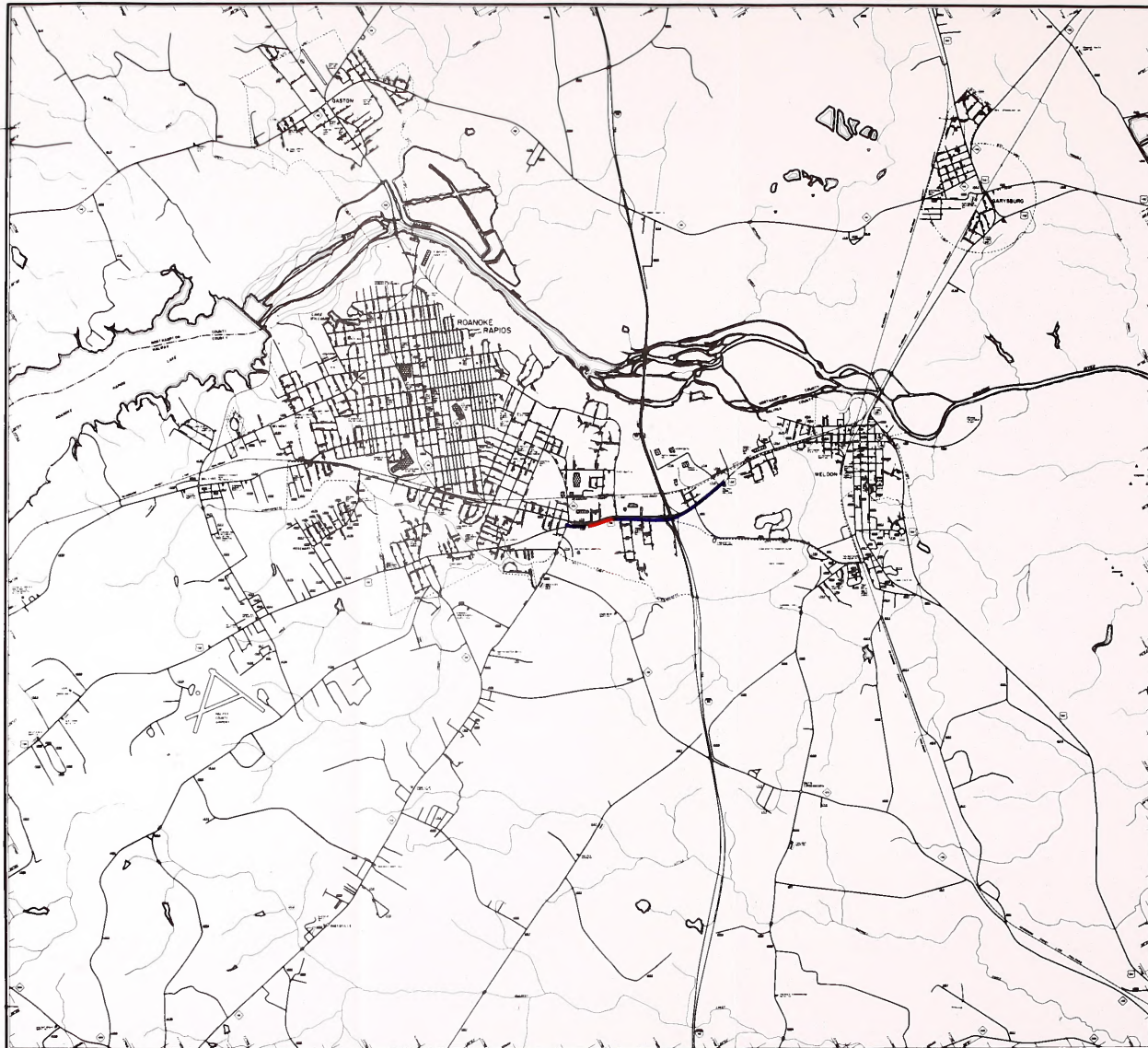
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# LEGEND

APPROACHING CAPACITY

OVER CAPACITY



## FIGURE 7

BASE YEAR VOLUMES  
COMPARED WITH CAPACITY

**ROANOKE RAPIDS  
AND VICINITY**  
HALIFAX & NORTHAMPTON COUNTIES

**NORTH CAROLINA**

PREPARED BY  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
IN COOPERATION WITH  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

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OCTOBER, 1966

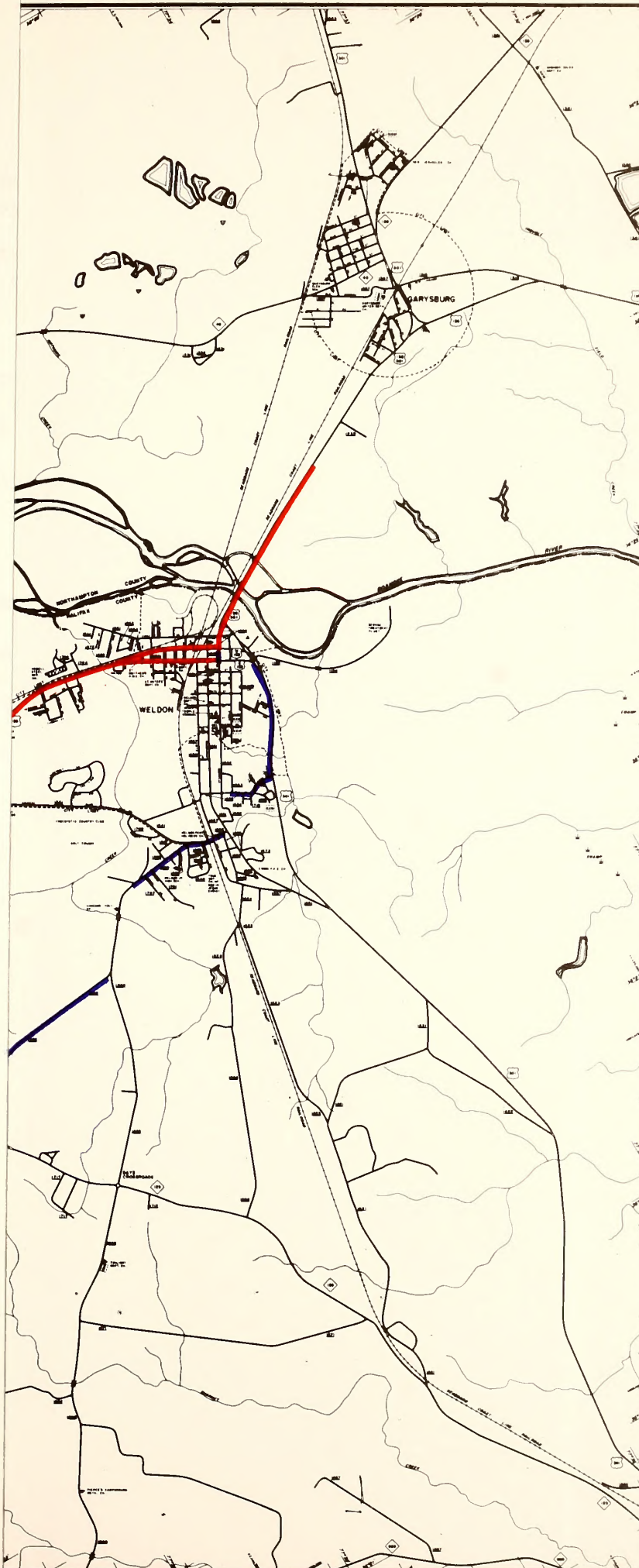


ROADS  
RIVERS

FIGURE 1

BASE MAP FOR  
ROADS AND RIVERS

ROANOKE RAPIDS  
NORTH CAROLINA  
1960  
U.S. GEOLOGICAL SURVEY  
WASHINGTON, D.C.



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  - 100. ROAD

**LEGEND**

—— APPROACHING CAPACITY

—— OVER CAPACITY



**FIGURE 8**

**2020 VOLUMES COMPARED WITH CAPACITY**

**ROANOKE RAPIDS**  
AND VICINITY  
HALIFAX & NORTHAMPTON COUNTIES  
NORTH CAROLINA

PREPARED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS - PLANNING AND RESEARCH BRANCH  
IN COOPERATION WITH THE  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

SCALE  
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MILES

OCTOBER, 1961

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LEGEND

APPROXIMATE CAPACITY  
 OVER CAPACITY

ROANOKE RAPIDS  
 BASE YEAR VOLUMES  
 COMPARED WITH CAPACITY  
 FIGURE 7



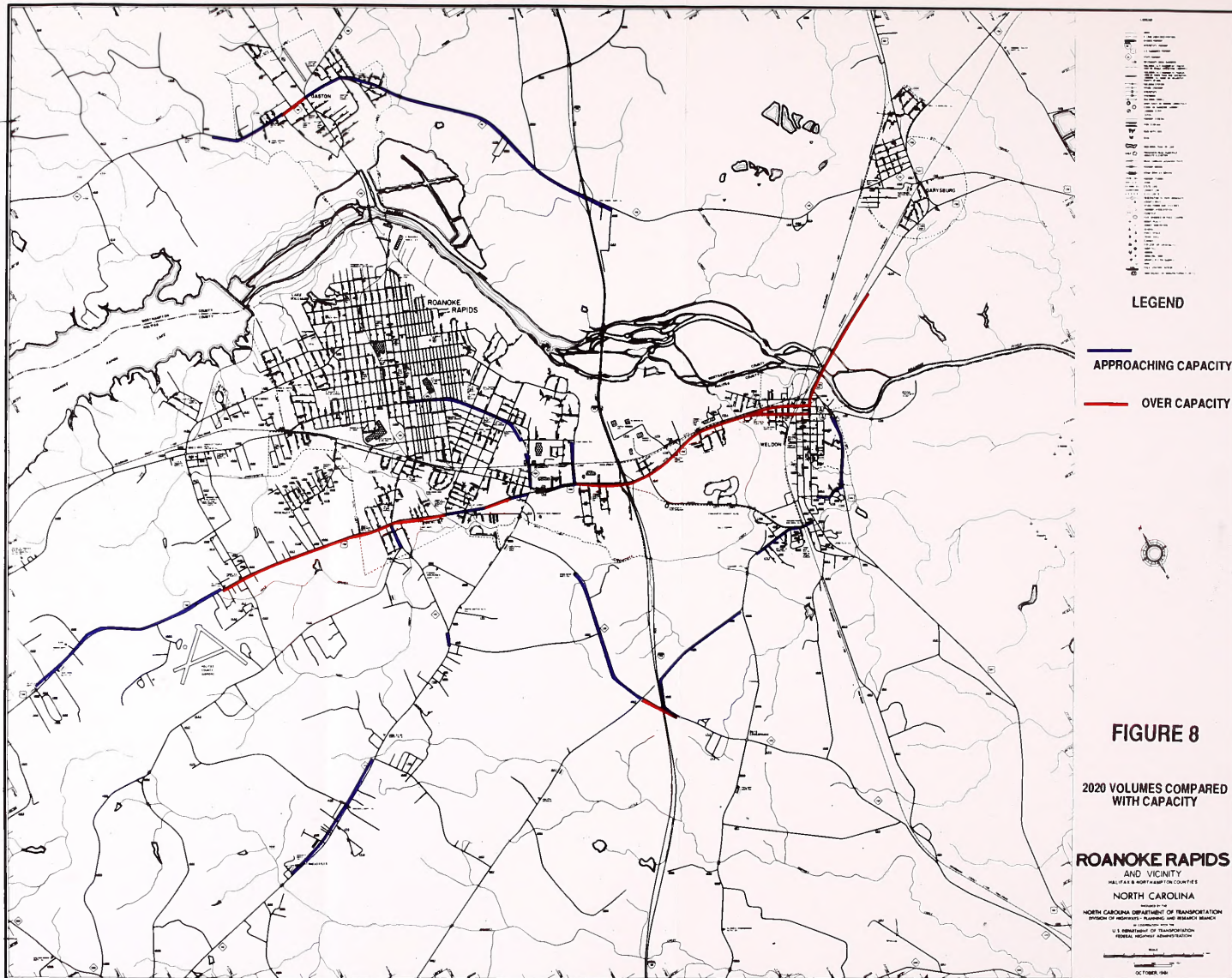




FIGURE 8

THE RIVER AND ITS TRIBUTARIES

ROUBIDOUX RIVER

AND ITS TRIBUTARIES  
A. J. HARRIS  
1880

### **System Deficiencies**

System deficiencies are a measure of the extent to which the existing system lacks continuous radials, loops, crosstowns, and bypasses. System deficiencies in the Roanoke Rapids-Weldon-Gaston Planning Area are the lack of loops and bypasses putting a heavy burden on crosstown facilities such as US 158.

### **Special Corridors**

National Truck Network routes, as designated by the U.S. Secretary of Transportation for STAA (Surface Transportation Assistance Act) vehicles, dated September 1989, includes US 158 and I-95. The North Carolina Intrastate System, revised December 1990, includes NC 158 as a route that needs improvements.

### **Goals and Objectives**

Each area has its own priorities and concerns relating to the transportation system, and related topics. In order to determine the items of importance to the planning area, a "Goals and Objectives" survey was conducted in 1991. The survey included questions about topics such as new roads, improvement to existing roads, sidewalks, traffic signals and truck routes.

Several questions were intended to solicit specific responses. A space was provided for comments at the end of the survey.

Roanoke Rapids distributed the survey forms to citizens by inserting them in the local newspaper along with a story describing their purpose. Fifty-nine (59) responses were received. Appendix C includes a copy of the survey, the results and the comments received.

THE UNITED STATES OF AMERICA

TO THE HONORABLE SENATE OF THE UNITED STATES  
IN SENATE, FEBRUARY 1, 1900.  
REPORT OF THE  
COMMISSIONER OF THE GENERAL LAND OFFICE  
ON THE  
LANDS BELONGING TO THE UNITED STATES  
IN THE TERRITORY OF ARIZONA.

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## VI. RECOMMENDED 1992 THOROUGHFARE PLAN

### Analysis of the May 1978 Plan

A Thoroughfare Plan study uncovers the need for new facilities, plus identifies existing and future deficiencies in the transportation system. The Thoroughfare Plan is a representation of the existing highway system by functional use, e.g., major thoroughfares, minor thoroughfares plus any new facilities which are needed. The planning methodology enables identification of deficiencies in the existing system, allowing compilation of a list of needed improvements.

This chapter presents an analysis and makes recommendations based on the ability of the existing street system to serve the present and future travel desires as the area continues to grow. The usefulness of transportation planning is in the analysis of different highway configurations for their efficiency in serving the area. The recommended plan sets forth a system of thoroughfares to serve the anticipated traffic and land development needs for the Roanoke Rapids-Weldon-Gaston urban area. The need to eliminate existing and projected system deficiencies which cause traffic congestion is the primary objective of the plan. Providing a US 158 bypass around the area is a significant step in achieving the objective.

This plan is a revised version of the May 1978 Thoroughfare Plan. The recommended revisions are based on the results of a traffic forecast model that uses data on traffic counts, population, housing, employment, and vehicle ownership to simulate travel (See Chapter IV). With this model each major street and highway in the planning area is analyzed to determine its ability to serve existing and future traffic demands. In the development of an updated thoroughfare plan some proposals from the old thoroughfare plan have been implemented, some were found inadequate for current problems and were dropped and some new proposals were added. These changes and additions include:

- 1) Remove the north south one-way pairing of Hamilton and Jackson Streets. Roanoke Avenue can handle anticipated future traffic volumes through the center of Roanoke Rapids.
- 2) Delete the east west one-way pairing of Ninth and Tenth Streets in Roanoke Rapids. The existing section of Tenth Street, between Carolina Street and Oakley Avenue, can handle the anticipated future traffic volumes of 12,000 vpd. Also, due to the location of the Bibb Plant it would be difficult to construct the Ninth Street connector on the east end.
- 3) Delete the southern extension of S. Franklin Street to NC 48 at American Legion Road (SR 1683). According to the traffic model this extension will serve very little traffic.

- 4) Retain the Becker Drive extension to Grace Road (SR 1710). This extension removes some local traffic from US 158 and provides another access point to industries located along Grace Drive (SR 1710).
- 5) Retain the eastern extension of Country Club Road to US 301. This extension will form a southern cross town facility for the Town of Weldon and provide another access point for US 301 traffic.
- 6) Add a US 158 Bypass. This will serve as the major thoroughfare for east-west through trips and relieve congestion on existing US 158 through Roanoke Rapids and Weldon.
- 7) Extend Zoo Road (SR 1426) to US 125. This extension will provide a loop facility for traffic on the south side of the city.

### **Updated Thoroughfare Plan Recommendations**

The process of developing, testing and evaluating alternate plans involved a number of considerations. These included Roanoke Rapids-Weldon-Gaston area goals and objectives, identified deficiencies (See Chapter V), environmental impacts, existing and anticipated land development, and travel services. Aerial photography, topographic mapping, field reconnaissance and discussion with local staff, officials and interested local citizens provided additional basis for identifying and evaluating alternative alignments. The following describes the plan in terms of its functional parts as previously discussed in Chapter II of this report:

#### **Bypass Facility**

- (1) US 158 (See Chapter V) in the base year (1990) was found to be operating with average daily traffic volumes that exceed safe levels based on its design. Two options were considered to improve the operational efficiency of this facility. The first one was to widen the existing facility. But, due to the development along existing US 158 this would be a very expensive and destructive option; it was quickly eliminated. The second and recommended option is the construction of a US 158 bypass south of the existing facility. It is recommended that this be a four-lane controlled access facility with a 46-foot median. The new roadway would begin at Zoo Road (SR 1426) and travel south around Roanoke Rapids crossing I-95 with a controlled access interchange one mile south of existing US 158 and one mile north of the NC 125 crossing. From here it will continue around the south side of Weldon before tying into US 301 just south of its intersection with Washington Avenue (SR 1651) (See Figure 9). US 158 is part of the Intrastate system and is listed as a facility that needs improvement; therefore, funding for this bypass could come from the Highway Trust Fund.

It is anticipated that in the year 2020 the US 158 Bypass will carry up to 20,000 vpd.

## **Loop Streets**

### Roanoke Rapids

- (1) In Roanoke Rapids, Old Farm Road and Bolling Road/Zoo Road (SR 1426) serve as loop streets for the east and west sides of the city respectively. To serve the south side, it is proposed that Zoo Road (SR 1426) be extended from Sam Powell Dairy Road (SR 1434) to intersect with NC 48 and NC 125 (See Figure 9).

### Weldon

- (2) In Weldon, the extension of Country Club Road north to proposed Becker Drive and south to US 301 will form a loop around the south side of Weldon that will serve 5,000 vpd in the year 2020.

## **Radial Streets**

### Roanoke Rapids

- (1) West Tenth Street (SR 1400) is a east-west radial that has two cross sections. The first, is a two-lane, 24-foot wide, east-west radial that carries 3,000 vpd into Roanoke Rapids. This section has a capacity of 12,000 vpd and a design year volume that is anticipated to be 7,000 vpd. The second cross section begins at the Roanoke Rapids city limits and ends at Roanoke Avenue where SR 1400 becomes NC 125. It is four lanes wide with a capacity of 20,000 vpd. The existing traffic volume is 5,000 vpd. In the design year the this volume is expected to increase to 10,000 vpd. No improvement for SR 1400 is recommended.
- (2) US 158 is the busiest radial in the Roanoke Rapids-Weldon-Gaston planning area. It has a cross section that varies from three to seven lanes. The seven lane section has a capacity of 34,000 vpd and is currently carrying 34,500 vpd. This volume is projected to increase to 59,000 vpd by the year 2020. A substantial amount of this is through traffic going to and from the coasts of North Carolina and Virginia. US 158 also has a large amount of strip development on both sides which attracts additional traffic causing further congestion problems. Due to the large amount of development and number of lanes that already exist along US 158, it is not feasible to widen this facility. Therefore, it is proposed that a bypass be constructed to remove the through traffic from US 158 (See Figure 9).

- (3) Sam Powell Dairy Road (SR 1434) is a 2-lane 24-foot wide facility with a design year traffic volume anticipated to be 4,000 vpd. No improvement are recommended for the design period.
- (4) NC 48 is a 2-lane, 24-foot wide facility with a capacity of 12,000 vpd. NC 48 is the primary route through the central business district of Roanoke Rapids. Anticipated design year is 15,000 vpd south of town to 7,000 vpd through town and 14,000 vpd north of town. It is proposed that the southern portion of NC 48 be widened from Smith's Church Road (SR 1433) to Sam Powell Dairy Road (SR 1434) to a three-lane facility to accommodate this future traffic. North of town it is proposed that Hamilton Street be extended to intersect with NC 48 (See Figure 9) reducing traffic volumes on NC 48 through the central business district.
- (5) Existing NC 125 is a north-south radial that terminates as Tenth Street in the center of Roanoke Rapids. In the Transportation Improvement Program (TIP) it is proposed that NC 125 be routed away from Tenth Street to Old Farm Road after the construction of the Old Farm Extension. Also, programmed in the TIP is the conversion of the existing grade separation at I-95 into an interchange. Currently traffic volumes on NC 125 range from 5000 vpd south of town to 19,000 vpd along Tenth Street in Roanoke Rapids. These volumes are expected to increase to 13,000 vpd and 24,000 vpd respectively with the construction of the interchange and the rerouting of NC 125.

#### Weldon

- (1) US 158 in Weldon is a 4-lane facility that is currently carrying 15,000 vpd through Weldon. In the design year this volume is expected to increase to 32,000 vpd without the construction of a bypass. With the bypass the volume will be reduced 17,000 vpd through Weldon.
- (2) SR 1600 is a 2-lane, 24-foot wide facility with an existing traffic volume of 1,000 vpd. The anticipated design year traffic volume is 2,000 vpd. No improvement is recommended for SR 1600.
- (3) US 301 is a 2-lane, 24-foot wide, north-south radial that extends south to Rocky Mount and north to Virginia. It has a capacity of 12,500 vpd and is anticipated to carry 10,000 vpd in the design year. No improvements are recommended for the planning period.

## Gaston

- (1) NC 46 is a two-lane, 24-foot wide, east-west route that currently carries approximately 6,000 vpd through Gaston. By the year 2020 volumes are expected to increase to 13,000 vpd. The TIP has project U-2813 listed to widen the existing facility in the city to a multi-lane curb and gutter section. For the section from the eastern city limits of Gaston to I-95 safety improvements are recommended.
- (2) NC 48 is a two-lane, north-south radial route that carries 9,000 vpd through Gaston. By the design year this volume is expected to increase to 17,000 vpd. This section of NC 48 is to be widened to a multi-lane curb and gutter facility as project U-2419 in the 1991-1997 Transportation Improvement Program. The capacity of this proposed roadway will be approximately 20,300 vpd.

## **Crosstown Streets**

### Roanoke Rapids

- (1) Tenth Street is a major east-west crosstown route which carries NC 125 traffic into the central business district. It has a capacity of 20,000 vpd and serves both industrial and residential traffic. The existing traffic volume is 18,000 vpd. By the design year 2020, this volume is expected to increase to 24,000 vpd. The rerouting of NC 125 traffic to Old Farm Road will remove some traffic from Tenth Street. But, the extension of Becker Drive to SR 1710 in Weldon is expected to attract traffic to this route offsetting any gains made by rerouting NC 125. No improvements for Tenth Street are recommended.
- (2) Old Farm Road/Seventh Street serves as a major east-west crosstown facility. It carries primarily residential traffic to and from the downtown area. NC 125 traffic is to be rerouted to this facility. The existing traffic volume on this route is 6,000 vpd. The year 2020 traffic volume is expected to be 14,000 vpd. Some widening may eventually be required on Seventh Street.
- (3) Becker Drive serves as a connector between Tenth Street and Old Farm Road. It is proposed that it be extended with a 2-lane 24-foot wide facility capable of carrying 12,000 vpd to SR 1710 in Weldon. This will provide an alternate route to the industrial park located on SR 1710 and for local traffic an alternate route to Weldon thereby reducing congestion along US 158. The construction of this connector could increase traffic volumes on Tenth Street to 24,000 vpd.

- (4) Marshall Street serves as a north-south crosstown facility. It is a 2-lane, 33-foot wide roadway with parking that has a capacity of 12,000 vpd. The current and design year traffic volumes are 2,000 and 3,000 vpd respectively. No improvements are recommended for the design period.
- (5) Bolling Road (SR 1426) serves as a crosstown facility on the west side of Roanoke Rapids. It is a 2-lane, 24-foot wide facility that carries 3,000 vpd. The design year 2020 volume is expected to be 6,000 vpd. Improvements to this road are planned in the 1991-1997 TIP as project U-1007 which calls for widening the existing roadway to a multi-lane curb and gutter facility.

#### Weldon

- (1) Washington Avenue (SR 1651) serves as a major north-south route through the center of Weldon. This 2-lane, 24-foot wide facility serves primarily local traffic. The current traffic volume using this route is 2,000 vpd. The year 2020 volume is anticipated to be 3,000 vpd. No improvements for this route are recommended.

### **Minor Thoroughfares**

#### Roanoke Rapids

- (1) Oakley Avenue is a 2-lane, 18-foot wide facility that connects Bolling Road (SR 1426) and Tenth Street. It is recommended that Oakley Avenue be widened to 24 feet with improved shoulders and vertical alignment.
- (2) Jackson Street serves as a north-south crosstown facility through Roanoke Rapids central business district. The existing 2-lane facility is adequate for future traffic demands.
- (3) Hamilton Street serves the same function as Jackson Street. It is proposed that the north end of this street be extended to intersect with NC 48 north of town. This will provide an alternate route to remove crosstown traffic from Roanoke Avenue if congestion problems occur.
- (4) Washington Street is a north-south crosstown street that serves primarily local residential traffic. This street is adequate for future traffic demands and no improvements are recommended during the planning period.
- (5) Fifth Street, west of Roanoke Avenue, is a east-west crosstown street that serves the residential area on the east side of Roanoke Rapids. No improvements are recommended for the design period.

- (6) Carolina Street, a north-south crosstown street, links the east side residential area with Tenth Street and Virginia Avenue. No traffic problems are foreseen and no improvements are recommended for this facility.
- (7) Twelfth Street serves as an east-west crosstown street that connects Jackson Street, Roanoke Avenue, Hamilton Street, Washington Street and Marshall Street on the southside of town. The existing facility is adequate for the design period and no improvements are recommended.
- (8) Thirteenth Street also is an east-west crosstown street that loops around the south side of the central business district connecting three major thoroughfares, Tenth Street, Roanoke Avenue and Marshall Street. One of Roanoke Rapids' major industries, Bibb Company has a plant located here. No improvements over the planning period are recommended for Thirteenth Street.
- (9) Park Avenue is a north-south minor thoroughfare used by residents of the east side of Roanoke Rapids to access Marshall Street, Tenth Street and Old Farm Road. No improvements are recommended for this street.
- (10) Georgia Avenue is a minor thoroughfare used by local traffic to travel between Tenth Street and Weldon Road. North of Tenth Street Georgia Avenue is a 20 foot facility that dead ends before reaching Old Farm Road. It is recommended that this section be extended to Old Farm Road and widened to 24 feet.
- (11) American Legion Road (SR 1683) is a minor thoroughfare that serves as a loop facility connecting NC 48 and NC 125. No improvements are recommended.

#### Weldon

- (1) Sycamore Street (SR 1684) connects the one-way US 158 pair through Weldon with US 301 north of town. No improvements are recommended for this connector.
- (2) Eleventh Street (SR 1655) connects Country Club Road with Washington Street in Weldon. No improvements are recommended for this minor thoroughfare.

#### **Traffic Operations**

In Roanoke Rapids there are three streets that carry the majority of north-south traffic through town. These streets are Jackson Street, Roanoke Avenue and Hamilton Street. In the year 2020, it is anticipated that Jackson and Hamilton Streets will carry 8,000 vpd each while Roanoke Avenue will bring 12,000 vpd through town. These traffic volumes will cause some congestion problems in the central business district. The implementation of

a one-way pair using Jackson Street and Hamilton Street could provide relief to downtown congestion with a minimum of cost and community disruption. This alternate is shown in the May, 1978, thoroughfare plan.

Traffic signal progression should be studied and revised as needed. As part of this study, locations for future signals should be considered to provide for future progression patterns. It should be stressed that contrary to popular belief, traffic signals are not always the solution to traffic problems, and in fact, typically worsen the problem if utilized incorrectly.

There are some two-lane roads in the Roanoke Rapids-Weldon-Gaston area which have paved widths less than 22 feet, which is the minimum desirable cross-section. The desirable lane width of 12' yields a 24' paved roadway. Narrow roadways increases the likelihood of accidents between vehicles traveling in the opposite direction. This becomes more critical as traffic increases to 5,000 or 6,000 vpd as there is increased incidence of meeting oncoming traffic.

### **Summary of Recommendations**

This report contains numerous recommendations for the Roanoke Rapids-Weldon-Gaston transportation system. The following is a brief review of these recommendations.

**Cross-sections** - Each facility on the Thoroughfare Plan is discussed in detail earlier in this chapter. A summary of the recommended cross-sections for each facility is in Appendix E. The minimum desirable cross-section is twenty-four feet with paved shoulders or curb and gutter.

**New Facilities** - New facilities are needed throughout the planning area. They provide for continuity of travel, corridor spacing, and/or a more direct travel path. Some of the more important new facilities recommended by the Plan include:

- The US 158 Bypass, which would be a controlled access facility on new location, would provide an alternate route for existing US 158 traffic just passing through Roanoke Rapids and Weldon.
- The extension of Zoo Road (SR 1426) across NC 48 to NC 125 providing a loop facility on the south side of Roanoke Rapids.
- The extension of Becker Drive in Roanoke Rapids to Grace Road (SR 1710) in Weldon. This extension will provide another access point to the industrial park on Grace Road (SR 1710). It also will help reduce congestion on existing US 158. This improvement was included in the previous thoroughfare plan

- The Country Club Road extension north to the proposed extension of Becker Drive and south to Elm Street (SR 1657) and US 301. This connection will provide for more direct travel from Roanoke Rapids to the south side of Weldon without using US 158 when accessing US 301.

System Improvements - Often system improvements can provide additional capacity or improved traffic conditions with a minimum of capitol outlay. Recommended system improvements include:

- Consideration of an aggressive carpool/vanpool program and collection of vehicle occupancy count data. The capacity of a facility to carry people can be increased by increasing the occupancy of the existing vehicles.
- Encouragement of local businesses to stagger work hours to decrease traffic volume in the peak travel hours.
- A continuing program to assure proper timing and phasing of all traffic signals. Proper signal progression can have significant positive impact on a corridor; this is especially true with US 158.
- Protection of access control is one of the areas where a significant contribution can be made. The limiting of driveway permits along US 158 and the construction of a controlled access US 158 Bypass are good places to begin.
- For improved safety and capacity, one-way pairing of Jackson and Hamilton Streets should be considered in the future Roanoke Rapids-Weldon-Gaston update. This will mainly improve central business district traffic circulation and safety. Correct transitions at the termini of the one-way pair are crucial for the system to function properly.
- A single unprotected left turning car can expend the capacity equivalent of five through vehicles. The cross-section recommendations presume that the left turns at key intersections are provided.

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- LEGEND
- | EXISTING | PROPOSED |
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|          |          |
- FREEWAYS  
MAJOR THOROUGHFARES  
MINOR THOROUGHFARES  
INTERCHANGE  
GRADE SEPARATION



ADOPTED BY:

ROANOKE RAPIDS JUNE 9, 1992

GASTON JULY 14, 1992

WELDON JUNE 1, 1992

STATEWIDE PLANNING  
BRANCH

N. C. DEPT. OF  
TRANSPORTATION

PUBLIC HEARING DATE JUNE 9, 1992 JULY 14, 1992  
JUNE 1, 1992

**FIGURE 9**  
RECOMMENDED  
THOROUGHFARE PLAN  
**ROANOKE RAPIDS**  
AND VICINITY  
HALIFAX & NORTHAMPTON COUNTIES  
NORTH CAROLINA

PREPARED BY THE  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS - PLANNING AND RESEARCH BRANCH  
IN COOPERATION WITH THE  
U. S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

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MAY 8, 1992

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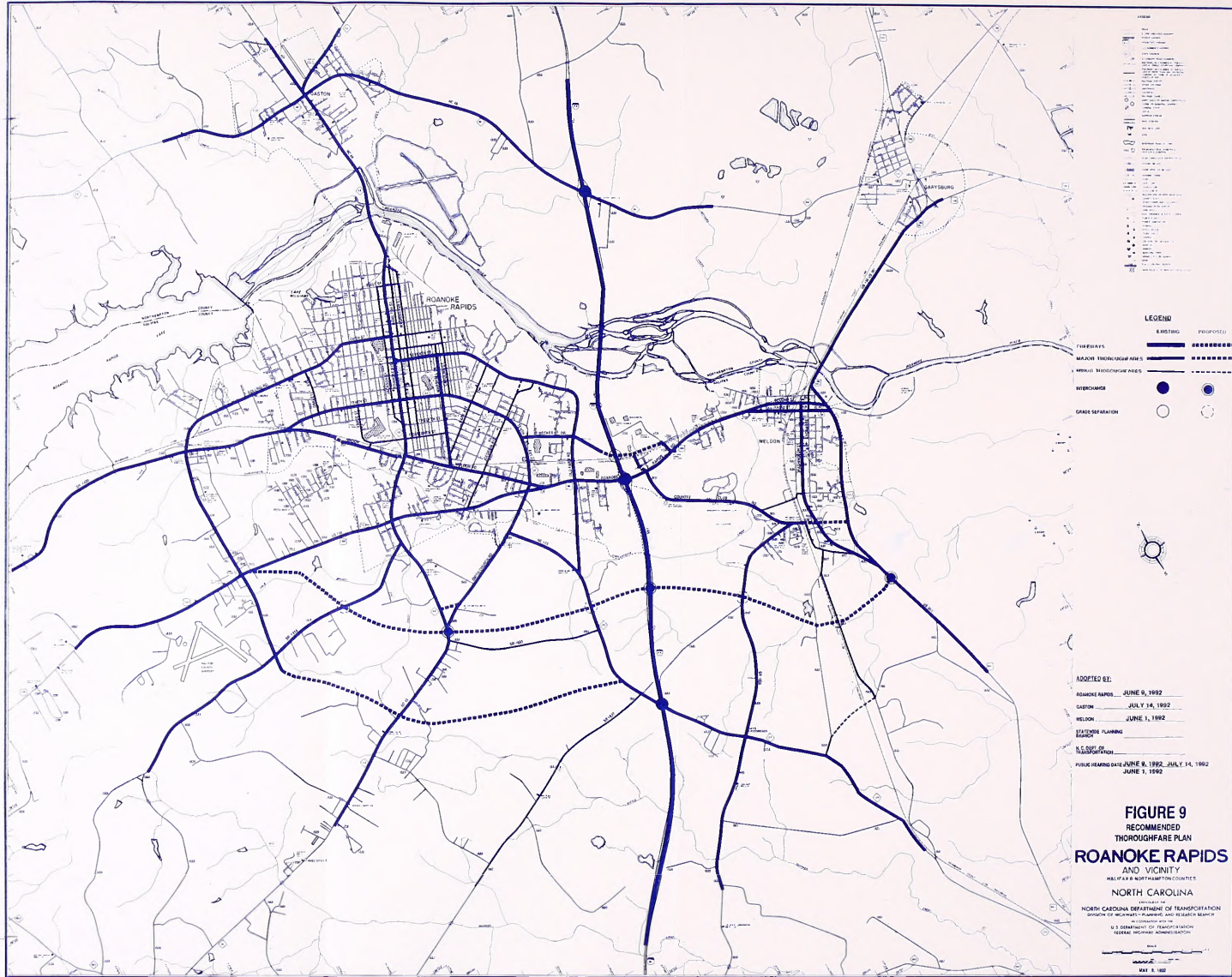
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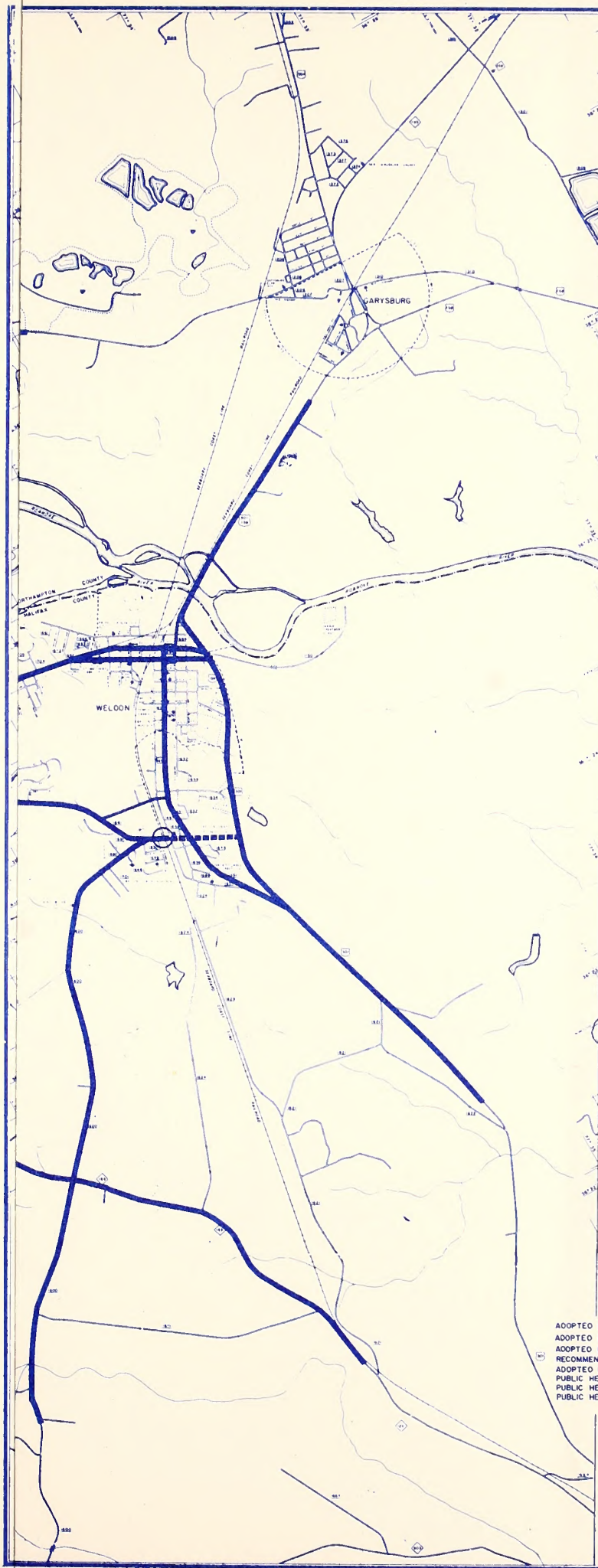
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ROANOKE RAPIDS  
 NORTH CAROLINA  
 1900  
 1:25,000  
 U.S. GEOLOGICAL SURVEY  
 WATER RESOURCES DIVISION  
 WASHINGTON, D.C.

1. Main channel  
 2. Tributaries  
 3. Swamps  
 4. Lakes  
 5. Dams  
 6. Railroads  
 7. Roads  
 8. Towns  
 9. Churches  
 10. Schools





## LEGEND

EXISTING PROPOSED  
 MAJOR THOROUGHFARE  
 FREEWAY  
 OTHER  
 MINOR THOROUGHFARE

INTERCHANGE  
 GRADE SEPARATION  
 2000 VOLUMES



## REVISIONS

RECOMMENDED APPROVAL BY PLANNING & RESEARCH BRANCH N. C. BOARD OF TRANSPORTATION

JUNE 9, 1978

JULY 14, 1978

CITY OF  
 ROANOKE RAPIDS

TOWN OF  
 WELDON

TOWN OF  
 GASTON

APRIL 4, 1978

## ROANOKE RAPIDS WELDON AND GASTON THOROUGHFARE PLAN

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PLANNING AND RESEARCH BRANCH

IN COOPERATION WITH THE

U.S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION



NOVEMBER 4, 1977

ADOPTED BY THE CITY OF ROANOKE RAPIDS DECEMBER 13, 1977

ADOPTED BY THE TOWN OF GASTON MARCH 6, 1978

ADOPTED BY THE TOWN OF WELDON JUNE 5, 1978

RECOMMENDED APPROVAL BY PLANNING AND RESEARCH BRANCH JUNE 9, 1978

ADOPTED BY THE NORTH CAROLINA BOARD OF TRANSPORTATION JULY 14, 1978

PUBLIC HEARING ROANOKE RAPIDS OCTOBER 6, 1977

PUBLIC HEARING GASTON NOVEMBER 7, 1977

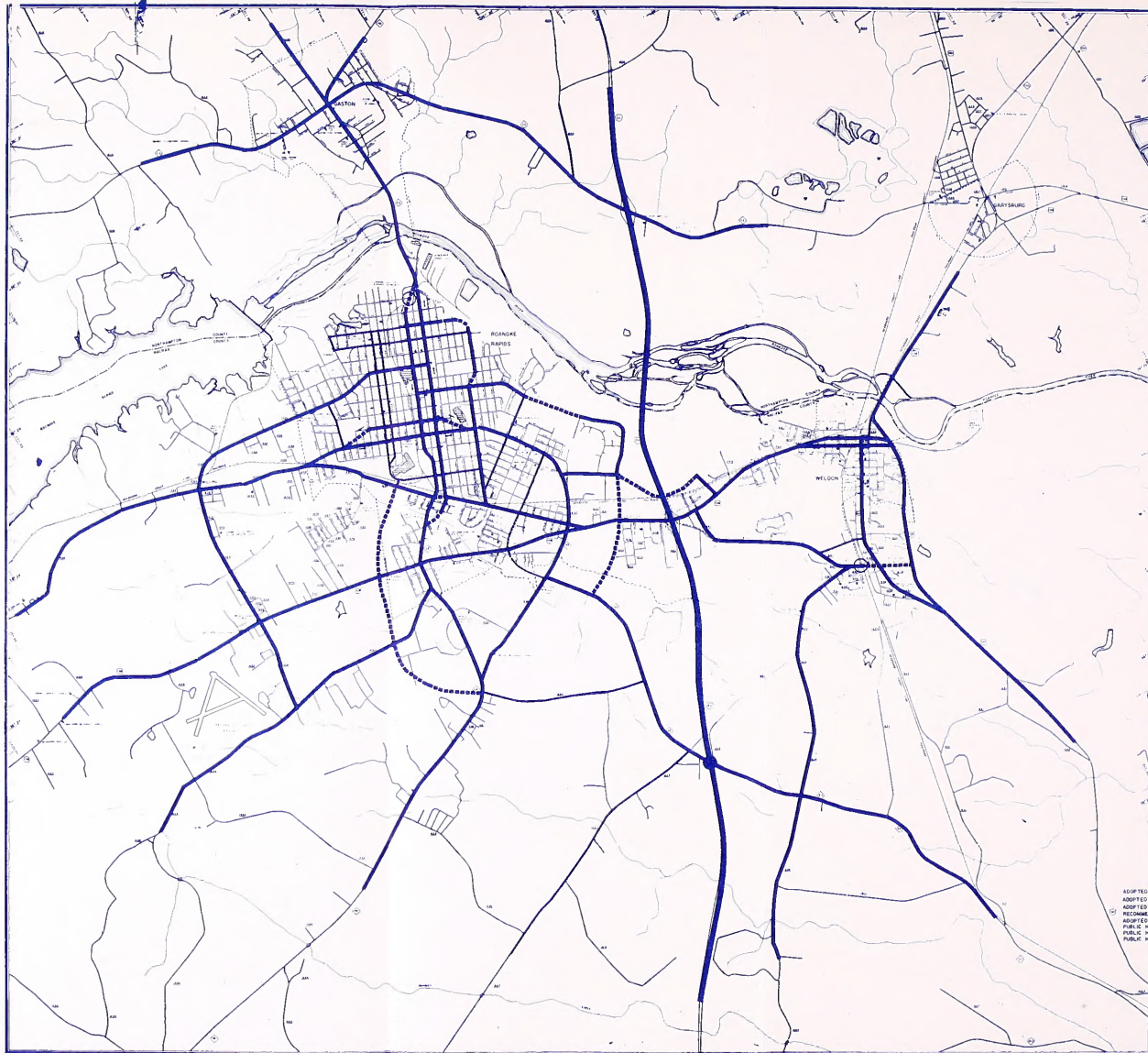
PUBLIC HEARING WELDON FEBRUARY 23, 1978

FIGURE 10

PLATE 1  
ROANOKE RIVER  
FROM THE NORTH  
TO THE SOUTH  
AND  
FROM THE WEST  
TO THE EAST

PLATE 2  
ROANOKE RIVER  
FROM THE NORTH  
TO THE SOUTH  
AND  
FROM THE WEST  
TO THE EAST





# LEGEND

MAJOR THOROUGHFARE  
 FREEWAY  
 OTHER  
 MINOR THOROUGHFARE



INTERCHANGE  
 GRADE SEPARATION  
 2000 VOLUMES



## REVISIONS

RECOMMENDED APPROVAL: N.C. BOARD OF  
 PLANNING & RESEARCH TRANSPORTATION  
 BRANCH

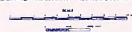
JUNE 5, 1978 JUNE 15, 1978

CITY OF ROANOKE RAPIDS TOWN OF WELDON TOWN OF GASTON

APRIL 5, 1978

## ROANOKE RAPIDS WELDON AND GASTON THOROUGHFARE PLAN

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 PLANNING AND RESEARCH BRANCH  
 IN COOPERATION WITH THE  
 U. S. DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION



NOVEMBER 4, 1977

ADOPTED BY THE CITY OF ROANOKE RAPIDS DECEMBER 13, 1977  
 ADOPTED BY THE TOWN OF GASTON MARCH 8, 1978  
 ADOPTED BY THE TOWN OF WELDON JUNE 15, 1978  
 RECOMMENDED APPROVAL: N.C. BOARD OF PLANNING AND RESEARCH BRANCH JUNE 5, 1978  
 ADOPTED BY THE NORTH CAROLINA BOARD OF TRANSPORTATION JUNE 15, 1978  
 PUBLIC HEARING ROANOKE RAPIDS DECEMBER 8, 1977  
 PUBLIC HEARING GASTON NOVEMBER 23, 1977  
 PUBLIC HEARING WELDON FEBRUARY 23, 1978

FIGURE 10

# LEGEND

1. Major roads  
2. Minor roads  
3. Railways  
4. Water bodies  
5. Forests  
6. Cultivated land  
7. Barren land  
8. Towns  
9. Villages  
10. Other features



Major roads



Minor roads



Railways



Water bodies



Forests



Cultivated land



Barren land



Towns



Villages



Other features



Scale bar



North arrow



Title box



Legend box



Scale bar



North arrow



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Legend box



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North arrow

FIGURE 10

## **VII. IMPLEMENTATION**

When developing a Thoroughfare Plan existing and future deficiencies in the transportation system are found and a strategy is devised to solve these problems by improving existing facilities and/or constructing new ones. Once this is done the plan must be implemented. Methods used to implement the Thoroughfare Plan as well as funding sources, environmental concerns and the anticipated cost are discussed in this chapter.

### **State and Municipal Adoption of the Thoroughfare Plan**

Chapter 136, Article 3A, Section 136-66.2 of the General Statutes of North Carolina provides that after development of a thoroughfare plan, the plan may be adopted by the governing body of the municipality and the Department of Transportation to serve as the basis for future street and highway improvements. The General Statutes also require that, as part of the plan, the governing body of the municipality and Department of Transportation shall reach agreement on responsibilities for existing and proposed streets and highways included in the plan. Facilities which are designated a State responsibility will be constructed and maintained by the Division of Highways. Facilities which are designated a municipal responsibility will be constructed and maintained by the municipality.

After mutual plan adoption, the Department of Transportation will initiate negotiations leading to determining which of the existing and proposed thoroughfares will be a department responsibility and which will be a municipal responsibility. Chapter 136, Article 3a, Section 136-66.1 of the General Statues provides guidance in the delineation of responsibilities. In summary, these statutes provide that the Department of Transportation shall be responsible for those facilities which serve volumes of through traffic and traffic from outside the area to major business, industrial, governmental, and institutional destinations located inside the municipality. The municipality is responsible for those facilities which serve primarily internal travel.

Thoroughfare plan adoption enables other planning tools such as the subdivision ordinance, zoning ordinance, official street map, and capital improvement program to be used to assist in plan implementation and thus minimize public cost and land use disruption.

# FUNDING SOURCES AND METHODS RECOMMENDED FOR IMPLEMENTATION OF PROJECTS

PROJECT	Funding Sources				Methods of Implementation				
	Local Funds	TIP Funds	Indust. Access	Small Urban	T-fare Plan	Subdiv. Ord.	Zoning Ord.	Future Street Lines	Development Review
US 158 Bypass		X			X				X
Ext. SR 1426 - NC 125		X			X	X	X		X
Country Club Rd. - US 301	X			X	X	X			
Becker Drive Ext. - SR 1710	X			X	X	X			X
Realignment of S. Salisbury St. with S. Main St.	X			X	X		X		X

## **Methods Used to Protect Adopted Thoroughfare Plan**

### **Subdivision Controls**

A subdivision ordinance requires that every subdivider submit to the Municipal Planning Commission a plot of his or her proposed subdivision. Certain standards must be met by the developer before he or she can be issued a building permit to construct the development. Through this process, it is possible to reserve or protect the necessary right-of-way for proposed streets which are a part of the thoroughfare plan and to require street construction in accordance with the plan.

Since some of the proposed thoroughfares, such as the US 158 Bypass, are outside the existing Roanoke Rapids, Gaston and Weldon City Limits, it is recommended that additional building setbacks and/or right-of-way reservation conforming to the Thoroughfare Plan also be applied in the Halifax and Northampton County Thoroughfare Plans. This will allow for orderly implementation of the plan in fringe areas without disrupting adjoining land owners.

### **Zoning**

A zoning ordinance can be beneficial to thoroughfare planning by designating appropriate locations of various land use and allowable densities of residential development. This provides a degree of stability on which to make future traffic projections and to plan streets and highways.

Other benefits of a good zoning ordinance are: (1) the establishment of standards of development which will aid traffic operations on major thoroughfares and (2) the minimization of strip commercial development which creates traffic friction and increases the traffic accident potential.

### **Future Street Lines Ordinance**

This ordinance is a particular benefit where widening of a street will be necessary at some time in the future. A municipality with legislative approval may amend its charter to be empowered to adopt future street line ordinances. Through a metes-and-bounds description of a street's future right-of-way requirements, the municipalities may prohibit new construction or reconstruction of structures within the future right-of-way. This approach requires specific design of the facility and would usually require surveys and public hearings to allow affected property owners to know what to expect and to make necessary adjustments without undue hardship. A specific ordinance can be enacted for selected streets, such as NC 46 in Gaston and NC 48 on the south side of Roanoke Rapids.

## **Development Reviews**

Often the municipality is the first point of contact for development interest. Any development that may impact a State maintained street or highway must be reviewed by the Department of Transportation. For example, driveway access to a State-maintained street or highway is reviewed by the District Engineer's office and the Traffic Engineering Branch of the Department of Transportation prior to access being allowed. If this is done at an early stage it is often possible to improve significantly the development's accessibility at minimal expense. In the case of thoroughfare planning, if a shopping center or industry is going to locate in the path of a proposed roadway the review process may provide an opportunity to modify the site to allow for the future roadway.

## **Roadway Corridor Official Map**

North Carolina General Statutes 136-44.50 through 133-44.53 are collectively designated as the "Roadway Corridor Official Map Act." For cities contemplating the adoption of a Roadway Corridor Map, more commonly referred to as an Official Street Map, there are several things to consider prior to implementation. First and foremost, it should be recognized that an Official Street Map designation places severe, but temporary, restrictions on private property rights. These restrictions are in the form of a prohibition for a period of up to three years on the issuance of building permits or the approval of subdivisions of property lying within an Official Street Map corridor. This authority should be used carefully and only in cases where less restrictive powers will be ineffective.

The statute establishing the Official Street Map authority is fairly explicit in outlining the procedures to be followed and the types of projects to be considered. As required by the statute, a project being considered for an Official Street Map must be programed in the State's Transportation Improvement Program (TIP) or included in a locally adopted Capital Improvements Program in addition to appearing on the adopted street system plan. The Statute states that the Capital Improvements Program must be for a period of ten years or less and must identify the estimated cost of acquisition and construction of the proposed project as well as the anticipated financing.

The Program and Policy Branch of the North Carolina Department of Transportation is responsible for facilitating the adoption of Official Street Maps. Cities considering Official Street Map Projects should contact this branch for their "Guidelines for Municipalities Considering Adoption of Roadway Corridor Maps" at:

NC Department of Transportation  
Program and Policy Branch  
Post Office Box 25210  
Raleigh, NC 27611

### **Funding Sources**

#### **Capital Improvements Program**

A capital improvement program makes it easier to build a planned thoroughfare system. This capital improvement program consists of two lists of projects. The first is a list of highway projects that are designated as a municipal responsibility and are to be implemented with municipal funds. The second is a list of local projects designated as State responsibility to be included in the Transportation Improvement Program.

#### **Transportation Improvement Program**

North Carolina's Transportation Improvement Program (TIP) is a document which lists all major construction projects the Department of Transportation plans for the next seven years. Similar to local Capital Improvement Program projects, TIP projects are matched with projected funding sources. Each year when the TIP is updated, completed projects are removed, programmed projects are advanced, and new projects are added.

During annual TIP public hearings, municipalities request projects such as the extension of Bethel Church Road to be included in the TIP. A Board of Transportation member reviews all of the project requests in a particular area of the state. Based on the technical feasibility, need, and available funding, the board member decides which projects will be included in the TIP. In addition to highway construction and widening, TIP funds are available for bridge replacement projects, highway safety projects, public transit projects, railroad projects, and bicycle projects.

#### **Industrial Access Funds**

If an Industry wishes to develop property that does not have access to a state maintained highway and certain economic conditions are met, then funds may be made available for construction of an access road.

## **Small Urban Funds**

Small Urban funds are annual discretionary funds made to municipalities with qualifying projects. The maximum amount is \$150,000 per year per project. A Town may have multiple projects. Requests for Small Urban Fund assistance should be directed to the appropriate Board of Transportation member and Division Engineer.

## **Other Funding Sources**

1. Assess user impact fees to fund transportation projects. These fees, called "facility fees" in the legislation, are based upon "reasonable and uniform considerations of capital costs to be incurred by the town as a result of new construction. The facility fee must bear a direct relationship to additional or expanded public capital costs of the community service facilities to be rendered for the inhabitants, occupants of the new construction, or those associated with the development process".
2. Enact a bond issue to fund street improvements.
3. Consider the possibility of specific projects qualifying for federal demonstration projects funds.
4. Adopt a collector street plan that would assess buyer or property owners for street improvement.
5. Charge a special assessment for utilities; for example increase water and sewer bills to cover the cost of street improvements.

## **Environmental Concerns**

The importance of the environment is becoming increasingly apparent and there is a need to make every effort to preserve it. In looking at proposed thoroughfares it is desirable to locate a corridor that will do the least amount of damage to the environment. Environmental factors usually considered in highway project evaluation can be divided into three major categories--physical, social and/or cultural, and economic environmental considerations (Table 7). Many of these are accounted for when a project is evaluated with respect to user benefits, cost and economic development potential. However, thirteen additional environmental factors need to be considered in these evaluations. They are the environmental impacts of a project on (1) air quality (2) water resources, (3) soils and geology, (4) wildlife, (5) vegetation, (6) neighborhoods, (7) noise, (8) educational facilities, (9) churches, (10) park and recreational facilities, (11) historic sites and landmarks, (12) public health and safety, and (13) aesthetics.

The summation of both positive and negative impacts probabilities with respect to these factors provides a measure of the relative environmental impact of a project.

Table 7 may be used as a guideline for interpreting the "Probable Impact" values in Table 10.

**TABLE 7**

<b>PROBABILITY ESTIMATION GUIDE</b>	
Subjective Evaluation	Impact Probability
Excellent - very substantial	0.90
Very good - substantial	0.60
Fair - some	0.40
Poor - none	0.10

**TABLE 8**

<b>Environmental Considerations</b>		
<b>Physical Environment</b>	<b>Social and/or Cultural Environment</b>	<b>Economic Environment</b>
Air Quality	Housing	Businesses
Water Resources	Neighborhoods	Employment
Wildlife	Noise	Economic Development
Vegetation	Education Facilities	Public Utilities
	Churches	Transportation Costs
	Park and Recreational Facilities	Capital Costs
	Public Health and Safety	Operation and Maintenance Costs
	Aesthetics	

Listed below are impacts associated with the recommended thoroughfare plan:

- The construction of the US 158 Bypass will cause both a positive and negative impact. The positive impact is the proposed roadway will reduce travel time and

should provide a safer environment for motorists. The negative impact is due to numerous stream and wetlands crossing. It is suggested that the use of "best management practices" (reduce side slopes, no staging in lowland sites, minimize wetland canopy removal, limited fill placement, etc.) be employed in an effort to minimize impacts to affected wetlands. Replacement of filled wetlands could be mitigated by the creation of enhancement areas contiguous to existing wetlands adjacent to the project.

The proposed alignment of US 158 Bypass will have some impact on animal life. Animals along the proposed corridor will seek refuge away from the highway margins and are largely adapted to living in association with human activity. However, there will be some loss of habitat which will contribute to the cumulative impact of development in the area.

### **Construction Priorities and Cost Estimates**

Construction priorities will vary depending on what criteria are considered and what weight is attached to the various criteria. Most people would agree that improvements to the major thoroughfare system and major traffic routes would be more important than minor thoroughfares where traffic volumes are lower. To be in the North Carolina Transportation Improvement Program, a project must show favorable benefits relative to costs and should not be prohibitively disruptive to the environment. The potential cost estimate of four Roanoke Rapids-Weldon-Gaston projects are given in Table 9. The evaluation of these projects with respect to user benefits, probability that economic development will be stimulated and environmental impact is given in Table 10.

Thoroughfare improvement needs identified and evaluated in the Roanoke Rapids-Weldon-Gaston Thoroughfare Plan are:

- The construction of a US 158 Bypass on the south side of Roanoke Rapids and Weldon.
- The extension of Zoo Road (SR 1426) to NC 125 south of Roanoke Rapids.
- The extension of Becker Drive crossing under I-95 to intersect with Grace Road (SR 1710) in Weldon.
- The extension of the west end of County Club Road to intersect with US 301.
- The extension of Hamilton Street to NC 48 on the north side of Roanoke Rapids.

TABLE 9

Potential Project Cost Estimates Investigated Projects		
Project	Project Description	Total Cost Including R/W
1	US 158 Bypass	\$38,560,000
2	Extension of SR 1426 to NC 125	\$ 3,540,000
3	Country Club Rd. Ext. to US 301	\$ 456,000
4	Becker Drive Ext. to SR 1710	\$ 550,000

TABLE 10

Benefits Evaluation for Investigated Projects						
Project	Benefits (1000's)	Costs (1000's)	Length Mile	Benefits per Mile	Econ. Dev. Potential	Eviron. Impact
US 158 Bypass	\$51,805	\$38,000	6.8	\$7,800	1.00	+0.6 -0.2
SR 1426 - NC 125	\$5,477	\$354	5.9	\$923	0.60	+0.5 -0.1
Country Cl. - US 301	\$3,287	\$456	0.4	\$7,470	0.30	+0.4 -0.1
Becker Dr.- SR 1710	\$43,080	\$550	0.6	\$76,928	0.80	+0.8 -0.0

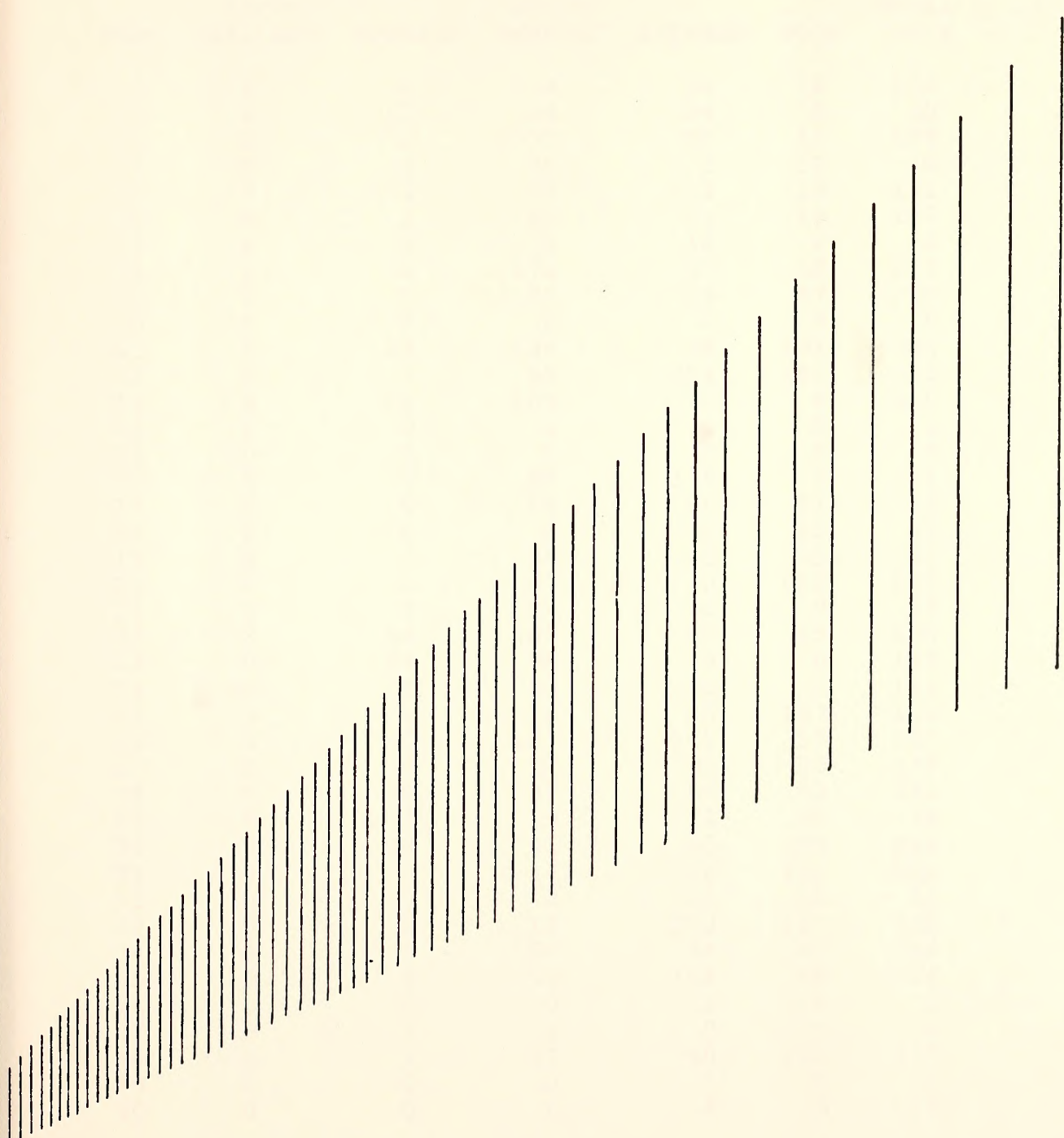
<p>1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the study and the objectives of the research.</p>	
<p>2. The second part of the report is a detailed description of the methodology used in the study. It includes information about the sample, the data collection methods, and the statistical analysis.</p>	
<p>3. The third part of the report is a discussion of the results of the study. It compares the findings with the previous research and discusses the implications of the study.</p>	
<p>4. The fourth part of the report is a conclusion and a list of references. The conclusion summarizes the main findings of the study, and the references list the sources used in the research.</p>	

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# APPENDICES



APRIL 1908

**APPENDIX A**  
**PLANNING AREA HOUSING AND EMPLOYMENT DATA**

TABLE A-1  
DWELLING UNIT SUMMARY 1990

ZONE	ABOVE EXCELLENT	AVERAGE	BELOW AVERAGE	AVERAGE	POOR	TOTAL DU'S
1	0	0	4	38	78	120
2	2	12	44	24	8	90
3	0	5	33	55	15	108
4	0	0	21	2	22	45
5	0	0	50	112	29	191
6	0	2	55	51	19	127
7	0	0	0	12	0	12
8	0	0	174	57	42	273
9	0	2	82	69	67	220
10	0	0	0	0	0	0
11	0	18	136	38	131	325
12	0	3	59	222	151	435
13	0	28	103	76	8	215
14	0	0	1	0	0	1
15	0	0	0	3	6	9
16	0	0	85	179	7	271
17	0	0	68	56	21	145
18	0	0	0	0	42	42
19	0	0	89	48	45	182
20	0	1	47	0	480	528
21	0	0	25	0	0	25
22	6	18	102	89	15	230
23	0	64	78	0	0	142
24	49	2	80	0	0	131
25	0	0	0	45	147	192
26	0	0	101	149	17	267
27	0	0	12	91	36	139
28	0	0	37	56	62	155
29	0	3	9	13	29	54
30	0	13	41	60	138	252
31	0	0	14	158	132	304
32	0	0	3	33	18	54
33	0	0	13	213	223	449
34	0	0	54	68	42	164
35	0	3	56	168	69	296
36	0	0	0	1	1	2
37	0	0	0	0	0	0
38	0	1	37	40	155	233
39	0	0	0	1	0	1
40	0	0	6	4	3	13

TABLE A-1  
DWELLING UNIT SUMMARY 1990

ZONE	ABOVE EXCELLENT	AVERAGE	BELOW AVERAGE	AVERAGE	POOR	TOTAL DU'S
41	0	1	10	90	18	119
42	0	0	74	32	6	112
43	0	7	30	17	5	59
44	0	0	31	68	185	284
45	0	0	2	48	27	77
46	0	0	8	0	0	8
47	0	0	5	13	19	37
48	0	1	5	10	80	96
49	0	0	51	51	411	513
50	0	0	2	7	13	22
51	0	0	3	25	22	50
52	0	0	26	64	90	180
53	0	0	17	48	18	83
54	0	0	9	48	214	271
55	0	0	33	92	173	298
56	0	0	2	32	85	119
57	0	0	10	13	55	78
58	0	0	12	83	26	121
59	1	0	22	18	81	122
60	0	0	1	4	24	29
61	7	33	60	0	9	109
62	0	0	2	8	26	36
63	0	1	7	13	22	43
64	0	0	0	0	0	0
65	0	6	19	103	120	248
66	0	0	6	18	66	90
67	12	50	131	16	1	210
68	25	21	61	15	26	148
69	0	0	18	15	13	46
70	0	0	8	84	22	114
71	0	0	7	40	90	137
72	1	1	5	4	28	39
73	0	0	4	12	0	16
74	2	39	101	117	1	260
75	0	0	3	71	129	203
76	0	0	0	0	14	14
77	0	9	44	24	21	98
78	16	25	3	1	1	46
79	0	0	16	4	5	25
80	0	0	4	62	78	144
81	0	0	17	104	15	136
82	0	0	0	1	10	11
83	0	0	0	0	0	0
84	0	0	1	10	15	26
85	0	0	2	4	5	11

TABLE A-1  
DWELLING UNIT SUMMARY 1990

ZONE	ABOVE EXCELLENT	AVERAGE	BELOW AVERAGE	AVERAGE	POOR	TOTAL DU'S
86	0	0	0	15	7	22
87	0	0	0	8	4	12
88	0	0	5	7	50	62
89	0	0	11	8	16	35
90	0	0	11	23	16	50
91	0	0	4	14	10	28
92	0	0	0	11	17	28
93	0	0	0	6	18	24
94	0	0	0	2	4	6
95	0	2	16	83	44	145
96	0	0	8	33	67	108
97	0	0	47	34	8	89

TABLE A-2  
EMPLOYMENT SUMMARY 1990

ZONE	SIC 1-49 INDUSTRY	50-54, 56,57,59 RETAIL	55,58 SPECIAL RETAIL	70,76 78-89,99 SERVICE	60-67 91-97 OFFICE	TOTAL	TOTAL CAR & TR.
1	0	19	6	18	7	50	13
2	2	0	1	12	1	16	14
3	3	0	0	13	11	27	95
4	8	50	6	43	12	119	49
5	3	2	1	2	0	8	22
6	4	6	4	5	1	20	26
7	1	0	0	3	0	4	0
8	0	0	0	1	0	1	0
9	0	0	0	3	0	3	1
10	2	0	0	0	0	2	11
12	1	2	1	2	0	6	5
13	1	1	0	10	0	12	6
14	1	0	0	2	0	3	3
15	7	0	2	4	1	14	66
16	0	5	7	6	3	21	3
17	0	2	1	4	2	9	2
18	0	31	12	14	6	63	0
19	1	4	2	6	4	17	11
20	0	2	3	18	3	26	12
21	0	0	0	1	0	1	0
22	3	10	2	25	4	44	14
23	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0
25	2	0	0	2	0	4	11
26	0	2	1	4	0	7	0
27	0	0	0	1	0	1	4
28	0	0	0	0	0	0	0
29	4	2	0	2	0	8	8
30	0	2	1	1	1	5	7
31	0	2	1	10	1	14	22
32	3	3	2	8	0	16	53
33	3	6	2	10	0	21	8
34	0	1	2	4	1	8	6
35	3	17	5	36	3	64	133
36	1	13	3	6	6	29	14
37	0	14	5	9	4	32	12
38	1	2	14	4	0	21	10
39	0	4	2	8	0	14	13
40	1	0	0	1	0	2	0
41	1	3	1	8	0	13	23
42	2	1	1	1	0	5	37
43	0	1	0	1	0	2	6
44	0	2	0	6	0	8	0
45	0	0	1	7	2	10	7

TABLE A-2  
EMPLOYMENT SUMMARY 1990

ZONE	SIC 1-49 INDUSTRY	50-54, 56, 57, 59 RETAIL	55, 58 SPECIAL RETAIL	70, 76 78-89, 99 SERVICE	60-67 91-97 OFFICE	TOTAL	TOTAL CAR & TR.
46	0	0	0	1	0	1	0
47	0	0	0	1	0	1	5
48	0	0	0	0	0	0	0
49	1	4	2	3	1	11	17
50	0	0	0	0	0	0	0
51	2	0	0	0	0	2	10
52	1	0	2	1	0	4	6
53	1	4	0	3	1	9	67
54	1	5	1	8	0	15	12
55	1	3	4	8	2	18	19
56	1	0	1	1	0	3	0
57	0	2	1	3	0	6	1
58	1	2	0	3	0	6	5
59	0	0	0	10	0	10	4
60	0	0	0	0	0	0	0
61	0	0	0	1	0	1	1
62	0	0	0	1	0	1	0
63	0	0	0	3	0	3	8
64	0	0	0	0	0	0	0
65	0	9	7	14	3	33	4
66	2	2	3	2	0	9	22
67	1	0	0	0	0	1	0
68	1	0	0	0	0	1	12
69	0	2	1	1	0	4	0
70	0	1	2	5	1	9	7
71	0	3	1	11	0	15	21
72	0	3	2	3	1	9	7
73	1	10	3	23	9	46	60
74	1	0	0	4	0	5	13
75	1	5	1	11	0	18	4
76	7	0	0	0	0	7	17
77	3	3	6	9	0	21	28
78	0	1	2	3	0	6	0
79	2	0	0	4	0	6	1
80	2	1	0	3	0	6	3
81	1	1	0	4	0	6	4
82	1	0	0	1	0	2	0
83	0	0	0	1	0	1	0
84	1	0	0	2	0	3	0
85	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0
88	0	0	0	2	0	2	0
89	0	0	0	0	0	0	0
90	0	1	0	3	0	4	0

TABLE A-2  
EMPLOYMENT SUMMARY 1990

ZONE	SIC 1-49 INDUSTRY	50-54, 56, 57, 59 RETAIL	55, 58 SPECIAL RETAIL	70, 76 78-89, 99 SERVICE	60-67 91-97 OFFICE	TOTAL	TOTAL CAR & TR.
91	0	2	0	0	0	2	0
92	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0
95	2	4	1	1	0	8	24
96	3	1	0	3	1	8	4
97	1	1	0	0	0	2	0

TABLE A-3  
DWELLING UNIT SUMMARY 2020

ZONE	EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	TOTAL DU'S
1	0	0	4	38	59	101
2	2	12	34	36	8	92
3	0	0	38	50	17	105
4	0	0	11	12	13	36
5	0	0	37	117	37	191
6	0	0	55	49	16	120
7	0	0	0	16	10	26
8	0	0	159	62	52	273
9	0	2	62	79	77	220
10	0	0	0	0	0	0
11	0	18	137	41	131	327
12	0	3	59	180	168	410
13	0	28	84	86	20	218
14	0	0	1	0	0	1
15	0	0	0	0	0	0
16	0	0	85	175	16	276
17	0	0	48	56	35	139
18	0	0	21	54	74	149
19	0	0	128	62	5	195
20	0	1	32	15	600	648
21	11	32	138	11	0	237
22	6	18	99	93	19	235
23	0	79	101	0	0	180
24	56	9	84	0	0	149
25	0	0	0	51	147	198
26	0	0	129	168	20	317
27	0	0	8	90	55	153
28	0	0	72	91	62	225
29	0	3	9	27	12	51
30	0	17	52	77	176	322
31	0	0	14	156	124	294
32	0	0	3	31	20	54
33	0	0	13	207	217	437
34	0	0	56	70	42	168
35	0	3	68	176	69	316
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	1	37	32	148	218
39	0	0	0	0	0	0
40	0	0	6	5	3	14
41	0	1	37	32	148	137
42	0	0	90	38	10	138
43	0	8	39	22	10	79
44	0	0	36	75	197	308
45	0	0	5	57	33	95
46	0	0	12	3	2	17
47	0	0	8	19	27	54

TABLE A-3  
DWELLING UNIT SUMMARY 2020

ZONE	EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	TOTAL DU'S
48	0	1	8	15	92	116
49	0	0	57	57	431	545
50	0	0	2	10	16	28
51	0	0	3	39	33	75
52	0	0	32	75	111	218
53	0	2	27	82	34	145
54	0	0	9	63	248	320
55	0	0	37	105	240	382
56	0	0	4	43	127	174
57	0	0	13	24	71	108
58	0	0	15	95	31	141
59	1	0	22	23	89	135
60	0	0	3	8	33	44
61	12	56	102	4	15	189
62	0	0	2	75	26	103
63	0	1	62	13	22	98
64	0	0	0	0	0	0
65	34	32	65	154	120	405
66	0	0	6	18	82	106
67	15	60	159	19	36	289
68	64	53	155	38	68	378
69	0	0	18	15	13	46
70	0	0	8	84	22	144
71	0	0	7	40	90	137
72	1	1	5	4	28	39
73	0	0	4	12	0	16
74	2	39	117	133	1	292
75	0	0	13	81	129	223
76	0	0	0	0	14	14
77	0	9	54	24	21	108
78	25	48	34	11	1	119
79	0	0	27	17	19	63
80	0	0	23	81	78	182
81	0	0	26	104	15	145
82	0	0	0	1	10	11
83	0	0	19	0	0	19
84	0	0	28	29	15	72
85	0	0	2	4	5	11
86	0	0	0	15	7	22
87	0	0	0	8	4	12
88	0	0	9	15	69	93
89	0	0	13	10	20	43
90	0	0	13	27	24	64

TABLE A-3  
DWELLING UNIT SUMMARY 2020

ZONE	EXCELLENT	ABOVE AVERAGE	AVERAGE	BELOW AVERAGE	POOR	TOTAL DU'S
91	0	0	5	17	16	38
92	0	0	0	13	20	33
93	0	0	0	8	21	29
94	0	0	0	4	7	11
95	0	2	16	124	44	186
96	0	0	72	106	129	307
97	0	1	83	51	15	150

TABLE A-4  
EMPLOYEE SUMMARY 2020

ZONE	SIC 1-49 INDUSTRY	50-54, 56,57,59 RETAIL	55,58 SPECIAL RETAIL	70,76 78-89,99 SERVICE	60-67 91-97 OFFICE	TOTAL	TOTAL CAR & TR.
1	0	25	79	31	51	186	13
2	8	3	0	3	82	96	14
3	49	00	00	147	159	355	95
4	211	47	226	77	123	684	49
5	25	24	19	00	84	152	22
6	17	43	35	03	38	136	26
7	00	15	00	00	00	15	0
8	00	00	00	00	53	53	0
9	00	00	00	00	10	10	1
10	834	00	00	00	00	834	11
11	00	04	00	00	90	4	48
12	00	04	07	00	40	51	5
13	10	00	04	00	71	85	6
14	562	00	00	00	06	568	3
15	1748	06	00	07	16	1777	66
16	00	81	22	14	20	137	3
17	00	13	16	06	07	42	2
18	00	120	424	57	117	718	0
19	08	36	190	19	23	276	11
20	00	64	21	41	76	202	12
21	00	00	00	00	98	98	0
22	37	05	42	27	98	209	14
23	00	00	00	00	00	00	0
24	00	00	00	00	00	00	0
25	150	00	00	00	02	152	11
26	00	00	13	00	87	100	0
27	00	00	00	00	06	6	4
28	00	00	00	00	00	00	0
29	157	09	43	00	07	216	8
30	10	03	00	15	00	28	7
31	00	09	60	04	45	118	22
32	60	05	13	00	10	88	53
33	14	15	30	00	22	81	8
34	00	08	10	00	81	99	6
35	108	45	131	12	214	510	133
36	30	68	403	38	42	581	14
37	00	189	225	23	62	499	12
38	00	304	71	02	149	526	10
39	00	63	178	03	979	1223	13
40	135	15	45	00	10	205	0
41	37	00	18	36	24	115	23
42	64	11	02	00	06	83	37
43	00	00	10	00	00	10	6
44	00	06	14	00	10	30	0
45	00	06	03	09	55	73	7
46	00	06	00	00	06	12	0
47	00	03	00	00	54	57	5

TABLE A-4  
EMPLOYEE SUMMARY 2020

ZONE	SIC 1-49 INDUSTRY	50-54, 56,57,59 RETAIL	55,58 SPECIAL RETAIL	70,76 78-89,99 SERVICE	60-67 91-97 OFFICE	TOTAL	TOTAL CAR & TR.
48	00	03	00	00	03	6	0
49	02	12	19	00	28	61	17
50	00	00	00	00	03	3	0
51	22	05	00	00	03	30	10
52	87	09	00	00	08	104	6
53	86	07	09	00	22	124	67
54	02	08	11	00	91	112	12
55	06	31	25	41	14	117	19
56	00	02	00	00	00	2	0
57	06	05	03	00	09	23	1
58	16	00	03	00	08	27	5
59	00	07	18	00	23	48	4
60	00	00	00	00	00	00	0
61	00	00	48	06	22	76	1
62	00	00	00	00	01	1	1
63	00	00	00	00	60	60	60
64	00	00	00	00	00	00	0
65	18	36	44	16	78	192	192
66	47	42	24	03	68	184	184
67	13	00	00	00	00	13	0
68	26	00	00	00	00	26	12
69	00	12	00	00	02	14	0
70	00	03	02	00	16	21	7
71	00	05	22	00	126	153	21
72	27	00	58	03	28	116	7
73	56	07	77	70	108	318	60
74	23	00	00	00	77	100	13
75	51	04	48	00	42	145	4
76	875	00	00	05	08	888	17
77	14	177	29	04	376	600	28
78	00	33	02	00	47	82	0
79	00	00	00	00	23	23	1
80	238	00	16	00	47	301	3
81	03	00	04	00	07	14	4
82	01	00	00	00	00	1	0
83	00	00	00	00	00	00	0
84	03	00	11	04	02	20	0
85	00	00	05	00	00	5	0
86	00	00	00	00	00	00	0
87	00	12	07	00	00	19	0
88	19	08	13	00	14	46	0
89	00	00	00	00	00	00	0
90	12	12	18	00	38	80	0

TABLE A-4  
EMPLOYEE SUMMARY 2020

ZONE	SIC 1-49 INDUSTRY	50-54, 56,57,59 RETAIL	55,58 SPECIAL RETAIL	70,76 78-89,99 SERVICE	60-67 91-97 OFFICE	TOTAL	TOTAL CAR & TR.
91	00	00	09	00	00	9	0
92	00	00	00	00	00	00	0
93	00	00	00	00	00	00	0
94	00	00	00	00	00	00	0
95	91	06	23	06	06	132	24
96	35	00	12	12	41	100	4
97	03	00	00	00	00	3	0

## APPENDIX B

### TRAVEL FORECASTING MODELS

#### 1990 Travel

Travel forecasting models were developed and calibrated for the Roanoke Rapids-Weldon-Gaston Planning Area using 1990 socio-economic data and traffic counts. The techniques employed are in accordance with North Carolina's urban travel forecasting procedures.

A new enlarged planning area was created for the 1990 study that includes the 1978 Roanoke Rapids-Weldon-Gaston Planning Area plus some additional area north of Gaston. The new planning area is shown in Figure 3 and is broken down into 107 traffic zones (includes 10 dummy zones). These zones segregate, as far as possible the area into homogeneous land uses to aid in the development and calibration of the travel forecasting model and to aid in the forecasting of the 2020 socio-economic data (land uses).

Average weekday trip productions were estimated on a zonal basis in two categories: (1) trips produced by dwelling units, and (2) trips produced by commercially used vehicles. Seventy percent of the dwelling unit data for this thoroughfare plan was rated below average to poor. In order to compensate for this the generation rates were increased from the standard rates of Exec. 12, Above Avg. 10, Avg. 8, Below Avg. 6, Poor 4, to Exec. 12, Above Avg. 10, Avg. 9, Below Avg. 8.5, and Poor 8. However, with a few outlying zones the poor rating was correct and caused too many trips. To offset this the number of homes in these zones were reduced to lower the number of trips. The zones where this was done are:

<u>Zone</u>	<u>Counted Houses</u>	<u>Adjusted Houses</u>
54	BA-48, Poor-214	BA-34, Poor-107
49	BA-51, Poor-411	BA-36, Poor-205

The trip generation rates for commercially owned vehicles was borrowed from the Thomasville internal traffic survey. An estimated 6.7 trips per commercially owned vehicle was used.

The screenlines are shown on Figure 3. Final model calibration reflected the following screenline accuracy checks:

- (1) Screenline A (north to south along I-95 through the center of the planning area.) -- 99%
- (2) Screenline B (runs east to west along the railroad tracks through the center of the planning area.) -- 95%

The total trips generated by dwelling units and commercial vehicles were summed to produce total internally generated trips. They were reduced by a reduction factor of 0.85 to account for trips made by vehicles garaged inside the planning area but with destinations outside the planning area (these trips are included in the external station counts). The adjusted internal travel was separated into three purposes: home-based work (HBW) 25 %, other home-based (OHB) 53 %, and non home-based (NHB) 22%. Added to these internally generated trips are a component of internal trips that are generated by vehicles garaged outside the planning area. They are called secondary NHB trips and they totaled 16,450 in 1990. See Table B-1 for their development. These trips are added to the internally produced NHB trips and distributed to each zone based on each zone's relative attractiveness as determined by the internal regression equation. Zonal productions are developed automatically in a program developed by the North Carolina DOT called IDS.

The regression analysis uses zonal employment and housing as the independent variables and computes an estimate of trips attracted as the dependent variable. A special variable was added to the equation for large shopping center zones and zone 77 which contains Halifax Community College to increase their attractiveness. The final equations used are shown in Table B-1. (Total attractions are balanced to equal total productions by purpose.)

Traffic counts were taken at all major roads where they entered into the planning area. The 1990 through and external-internal travel indices were developed for the external stations using Technical Report Number 3 (Synthesized Through Trip Table for Small Urban Areas by Dr. David G. Modlin, Jr.) and the Fratar trip balancing program. This analysis estimates that there were 43,350 external-internal and 52,741 through trips for an average weekday in 1990.

The gravity model was used to distribute the internal trips (HBW, OHB, & NHB) and the external-internal travel while the through travel was assigned directly to the highway network on a minimum path basis. The trip length distribution curves and travel time factors (Friction Factors) required by the gravity model are given in Table B-4. The synthetic method of developing travel patterns was checked by comparing the assignment of the travel on the existing highway system to actual ground counts at established locations. The results of the accuracy checks (mentioned earlier as screenline checks) were felt to be within acceptable limits for the purpose of this study.

Design Year Travel (Year 2020)

**2020 Travel**

The year 2020 travel was developed using the same techniques employed in synthesizing the 1990 travel. These travel patterns were estimated by projecting the socioeconomic data to the year 2020, and then utilizing the 1990 internal travel development procedures to estimate 2020 travel. The City of Roanoke Rapids and Towns of Weldon, and Gaston provided projections of housing by zones for the year 2020.

The same trip generation rates were used for the year 2020 as for the base year 1990. The trip generation rates for the study are shown in Table B-1. These generation rates were applied to the DU's projected for each zone. The 2020 trip generation rates for trucks and commercially owned passenger cars was assumed to remain at 6.7 trips per vehicle.

**TABLE B-1**

**TRAVEL MODEL INPUT VARIABLES**

TRIP PERCENTAGES BY PURPOSE		YEAR	PERSONS/DU	PERSONS/VEH
Internal of Total 85%		1990	2.5	1.09
HBW 25 %		2020	2.4	1.00
OHB 53 %				
NHB 22 %				

$$\begin{array}{lcl} \text{COMPOSITE} & = & \frac{1990 \text{ PERSON/VEH.}}{2020 \text{ PERSON/VEH.}} \\ \text{FACTOR} & & \end{array} \quad \begin{array}{lcl} \text{USAGE} & & \\ \text{FACTOR} & \times & \end{array} \quad \begin{array}{lcl} \frac{2020 \text{ PERSON/DU}}{1990 \text{ PERSON/DU}} & & \end{array}$$

$$\begin{array}{lcl} \text{INCREASE FOR} & = & \frac{\text{AVERAGE 1990}}{\text{TRIP RATE}} \\ \text{GENERATION RATES} & & \end{array} \quad \begin{array}{lcl} \text{COMPOSITE} & & \\ \text{FACTOR} & \times & \end{array} \quad \begin{array}{lcl} \frac{\text{AVERAGE 1990}}{\text{TRIP RATE}} & & \end{array}$$

**EXAMPLE:**

$$\text{COMPOSITE FACTOR} = \frac{1.09}{1.00} \times \frac{2.4}{2.5} \times 0.99 = 1.04$$

$$\text{INCREASE FOR GENERATION RATES} = (8.51 \times 1.04) - 8.51 = 0.31 \quad (\text{use } 0.00)$$

The trip generation rates for the 2020 were not increased.

**TABLE B-1 (CONTINUED)**

<b>1990 TRIPS BY HOUSING TYPE</b>			
Housing Category	1990 Trip Generation Rate	Number of DU's	Trips
Excellent	12.0	121	1,452
Above Average	10.0	371	3,710
Average	9.0	2,693	24,237
Below Average	8.5	3,937	33,465
Poor	8.0	4,475	35,800
<b>TOTAL</b>			<b>98,664</b>

**Secondary NHB Trips Development:**

Secondary = Total Ext-Int - Ext-Int Trips Garaged x 0.60  
 NHB Trips                Trips                Inside Planning Area

1990 Secondary Trips = 0.60 (43,352 - 15,966) = 16,432

2020 Secondary Trips = 0.60 (84,609 - 19,823) = 38,872

**Regression Equations:**

The equation for the regression analysis is as follows:

OHB Y= .10X<sub>1</sub> + 8.4X<sub>2</sub> + 2.0X<sub>3</sub> + 2.6X<sub>4</sub> + 2.5X<sub>5</sub> + 5.0X<sub>8</sub> + 5.0X<sub>9</sub>

NHB Y= .20X<sub>1</sub> + 8.4X<sub>2</sub> + 2.0X<sub>3</sub> + 2.6X<sub>4</sub> + 2.5X<sub>5</sub> + 5.0X<sub>8</sub> + 5.0X<sub>9</sub>

EXT Y= .50X<sub>1</sub> + 8.4X<sub>2</sub> + 2.0X<sub>3</sub> + 2.6X<sub>4</sub> + 2.5X<sub>5</sub> + 5.0X<sub>8</sub> + 5.0X<sub>9</sub>

WHERE: Y = Attraction factor for each zone

X<sub>1</sub> = Industry (SIC codes 1-49)

X<sub>2</sub> = Special Retail (SIC codes 50-54, 56, 57, 59)

X<sub>3</sub> = Retail (SIC codes 55,58)

X<sub>4</sub> = Office (SIC codes 60-67, 91-97)

X<sub>5</sub> = Services (SIC codes 70-76, 78-89, 99)

X<sub>8</sub> = Large Shopping Center Employment

X<sub>9</sub> = Community College

Special Retail (X<sub>2</sub>) which is made up of fast food restaurants, convenience stores, and banks with drive-in windows operate at much higher traffic generation rates than traditional retail establishments which are listed as Retail (X<sub>3</sub>).

The breakdown of internal trips by purpose and percentage of non-home based trips generated externally are shown in Table B-2.

**TABLE B-2**

<b>TRAVEL DATA SUMMARY</b>			
Type	1990	2020	Change
Average Daily Trips per DU	8.51	8.54 <sup>a</sup>	
Internal Trips	107,279	150,700	+40%
Home Based Work	22,619	28,082	
Other Home Based	19,905	24,712	
Non-Home Based, internal	47,952	59,534	
NHB secondary	16,803	38,372	
Internal <-> External	43,352	84,609	+95%
Through Trips	52,741	163,636	+95%
<b>TOTAL DAILY TRIPS</b>	<b>203,372</b>	<b>398,945</b>	

<sup>a</sup> differences are due to rounding  
Change = % increase from 1986 to 2020

Trip attraction factors for OHB and NHB purposes were determined by using the 1990 regression equation with projected 2020 zonal employment and dwelling unit data. Trip attraction factors for HBW trips were taken as the total projected zonal employment for the design year. The distribution of 2020 employment, as shown in Appendix A, Table A-4, was based on expected land use development as determined by the local staff. Design year internal trips were again distributed by the gravity model.

TABLE B-3

CORDON STATION TRAVEL						
COMPUTER	BASE YEAR - 1990			FUTURE YEAR - 2020		
STATION	Total ADT	Thru Trip End	Ext-Int Trips	Total ADT	Thru Trip End	Ext-Int Trips
110	27,744	24,137	3,607	71,380	64,242	7,138
111	700	13	687	1,800	62	1,738
112	4,435	907	3,528	11,410	4,290	7,120
113	730	14	716	1,878	66	1,812
114	5,552	1,214	4,337	14,277	6,220	8,057
115	640	11	629	1,650	44	1,606
116	1,910	96	1,814	4,915	568	4,347
117	4,560	1,082	3,478	11,725	4,854	6,871
118	225	1	224	580	0	580
119	1,135	34	1,101	2,920	180	2,740
120	3,510	841	2,669	9,030	3,366	5,664
121	785	16	769	2,020	82	1,938
122	23,719	20,604	3,115	61,020	56,996	4,024
123	3,975	883	3,092	10,230	3,850	6,380
124	9,530	2,365	7,165	24,520	15,582	8,938
125	3,568	332	3,236	9,180	2,088	8,112
126	2,576	174	2,402	6,630	1,068	5,562
127	800	17	783	2,060	78	1,982

% Growth is the growth rate per year over the planning period, as determined using the formula:

$$\text{Future ADT} = \text{Present ADT} (1 + \text{growth rate})^{\text{number of years}}$$

TABLE B-4

FRICTION FACTORS & TRAVEL CURVE DATA  
ROANOKE RAPIDS-WELDON-GASTON AREA

## FRICTION FACTORS

## TRAVEL CURVES

TIME INTERVAL	FRICTION FACTORS				% TRIPS DISTRIBUTED			
	HBW	OHB	NHB	EXT-INT	HBW	OHB	NHB	EXT-INT
1	11300	12500	10400	10000	4.22	8.23	10.34	3.13
2	22900	21000	20000	18816	5.10	8.73	11.64	9.87
3	23000	23800	21800	26600	8.61	11.17	13.83	7.63
4	22800	24000	18600	29100	10.04	12.16	10.58	6.86
5	21300	23800	16000	25420	11.13	11.16	8.87	8.62
6	24400	21300	10200	18000	10.47	9.32	8.61	16.93
7	25200	20500	12200	12000	8.66	7.37	8.22	12.93
8	17600	11600	8700	7100	7.73	6.19	7.77	12.07
9	12800	5300	1900	3397	7.29	5.20	6.58	8.09
10	11700	3700	1300	2000	6.52	5.13	4.37	7.09
11	9600	2500	900	1100	5.65	4.37	3.10	2.98
12	8000	1700	600	600	5.10	4.09	2.44	3.25
13	6400	1100	400	400	3.89	2.89	1.65	0.37
14	4800	700	300	300	3.35	2.38	1.14	0.16
15	4000	500	200	250	2.24	1.61	0.86	0.02

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**APPENDIX C  
SURVEY RESPONSE, COMMENTS**

**GOALS AND OBJECTIVES SURVEY**

General

A copy of the Goals and Objectives Survey is included in Appendix C. It was distributed to the public through the local newspaper. The survey is followed by a compilation of the results of the survey and a listing of the comments received as part of the survey. Most surveys did not include a comment.

ROANOKE RAPIDS-GASTON-WELDON  
Goals and Objective Survey

The purpose of this survey is to solicit input from residents about the area transportation system. It is very important that you complete and return this form because your response could affect the direction of this planning effort. Thank you for taking your time to complete this questionnaire.

The following items are some of the things usually considered in the development of a transportation plan for a city. Please indicate how desirable each of the items is to you by marking the appropriate location on the given scale.

	NOT DESIRABLE	NEUTRAL	DESIRABLE	VERY DESIRABLE	MOST DESIRABLE
Time traffic signals to favor certain traffic flow	-----	-----	-----	-----	-----
Use one-way streets to increase traffic flow	-----	-----	-----	-----	-----
Decrease the amount of truck traffic through town	-----	-----	-----	-----	-----
Limit number of driveways of strip commercial development along busy streets	-----	-----	-----	-----	-----
Provide special routes for trucks	-----	-----	-----	-----	-----
Low construction cost of transportation system	-----	-----	-----	-----	-----
Improve transportation system to attract industry	-----	-----	-----	-----	-----
Sidewalks	-----	-----	-----	-----	-----
Parking on heavily traveled streets	-----	-----	-----	-----	-----
Improve traffic flow at intersections	-----	-----	-----	-----	-----
Improve conditions at railroad crossings	-----	-----	-----	-----	-----

Please rank how road capacity should be increased (1 is the most important, 5 is the least important)

\_\_\_\_\_ By limiting Parking along main streets entering Roanoke Rapids-Gaston-Weldon.

\_\_\_\_\_ By constructing additional traffic lanes.

\_\_\_\_\_ By constructing a bypass to remove through traffic from local streets.

\_\_\_\_\_ By improving the design of existing intersection and roadways.

\_\_\_\_\_ By encouraging people to ride together or ride public transportation.

Please answer the below questions by writing or circling an answer.

1. Have you ever been in or witnessed an accident because of hazardous traffic conditions in Roanoke Rapids, Gaston, or Weldon?      YES      NO

If so where did this occur? \_\_\_\_\_

Approximately what time of day and day of week was this? \_\_\_\_\_

2. Do you work in Roanoke Rapids-Gaston-Weldon?      YES      NO

Other than above, where \_\_\_\_\_

3. How many people are in your household? \_\_\_\_\_

How many are licensed drivers? \_\_\_\_\_

4. How many cars are there in your household that are used daily? \_\_\_\_\_

5. In transportation planning a trip is defined as a **ONE-WAY** journey of a person in an automobile or a transit vehicle to a destination. On a typical day how many trips do the people in your household make? Consider going to work, to school, to shop, to the grocery store, to lunch, to visit a friend etc. as trips. \_\_\_\_\_

Of these trips how many begin or end at home? \_\_\_\_\_

6. Would you be in favor of widening the road in front of your house to have a less congested transportation system?      YES      NO

7. Would you be willing to pay higher taxes to improve the transportation system?      YES      NO

**OTHER TRANSPORTATION IDEAS OR COMMENTS:**

Please mail or return this form to one of the following:

Charles Archer  
Town of Roanoke Rapids  
P.O. Box 38  
(644 Roanoke Ave.)  
Roanoke Rapids, NC 27870

Linda Griffin  
Town of Weldon  
P.O. Box 551  
(109 Washington Ave.)  
Weldon, N.C. 27890

Deannie Manning  
Town of Gaston  
P.O. Drawer M  
(223 Craige St.)  
Gaston, N.C. 27832

## Survey Results

The average response to the survey questions has been entered in survey format. Not all questions were answered on all returned surveys; each question therefore, had a different number of respondents. Fifty-nine surveys were from the Roanoke Rapids - Weldon - Gaston planning area.

The following items are some of the things usually considered in the development of a transportation plan for a city. Please indicate how desirable each of the items is to you by marking the appropriate location on the given scale.

	NOT DESIRABLE	NEUTRAL	DESIRABLE	VERY DESIRABLE	MOST DESIRABLE
Time traffic signals to favor certain traffic flow	-----	-----	-----	--4.46--	
Use one-way streets to increase traffic flow	-----	---2.49--	-----	-----	
Decrease the amount of truck traffic through town	-----	-----	-----3.63-	-----	
Limit number of driveways of strip commercial development along busy streets	-----	-----	--3.17----	-----	
Provide special routes for trucks	-----	-----	-----	4.03-----	
Low construction cost of transportation system	-----	-----	--3.35----	-----	
Improve transportation system to attract industry	-----	-----	-----	4.05-----	
Sidewalks	-----	-----	---3.51----	-----	
Parking on heavily traveled streets	-----1.93	-----	-----	-----	
Improve traffic flow at intersections	-----	-----	-----	--4.24----	
Improve conditions at railroad crossings	-----	-----	-----	--4.25----	

Please rank how road capacity should be increased (1 is the most important, 5 is the least important)

- | Rank | Avg. |   |
|------|------|---|
| 4    | 3.16 | By limiting Parking along main streets entering Roanoke Rapids-Gaston-Weldon. |
| 2    | 2.52 | By constructing additional traffic lanes.                                     |
| 1    | 1.96 | By constructing a bypass to remove through traffic from local streets.        |
| 3    | 2.64 | By improving the design of existing intersection and roadways.                |
| 5    | 4.60 | By encouraging people to ride together or ride public transportation.         |

Please answer the below questions by writing or circling an answer.

1. Have you ever been in or witnessed an accident because of hazardous traffic conditions in Roanoke Rapids, Gaston, or Weldon?      YES - 31      NO - 27

If so where did this occur? \_\_\_\_\_

NC 48 & NC46	E. 10th St.	Old Farm Rd. & US 158
US 158 @ Walser's Corner (2)	7th St. & Park Ave. (2)	10th St. & Roanoke Ave
5th St. & Roanoke Ave. (3)	Hamilton & 5th St.	US 158 & I-95
Weldon Rd.	Hal. Comm. College	
US 158 Near Shopping Center	5th & Jackson	
US 158 & Smith Ch. Rd.	3rd & Jackson	
Zoo Rd. & US 158	7th St. Ext. @ Burger King	
Moore's Bldg. @ 10th St.	Becker Dr. & 10th St.	

Approximately what time of day and day of week was this? \_\_\_\_\_

2. Do you work in Roanoke Rapids-Gaston-Weldon?      YES - 42      NO - 14  
Other than above, where \_\_\_\_\_

3. How many people are in your household? \_\_\_\_\_

How many are licensed drivers? \_\_\_\_\_

4. How many cars are there in your household that are used daily? \_\_\_\_\_

5. In transportation planning a trip is defined as a **ONE-WAY** journey of a person in an automobile or a transit vehicle to a destination. On a typical day how many trips do the people in your household make? Consider going to work, to school, to shop, to the grocery store, to lunch, to visit a friend etc. as trips. \_\_\_\_\_

Of these trips how many begin or end at home? \_\_\_\_\_

6. Would you be in favor of widening the road in front of your house to have a less congested transportation system?      YES - 18      NO - 37

7. Would you be willing to pay higher taxes to improve the transportation system? YES - 19 NO - 39

**OTHER TRANSPORTATION IDEAS OR COMMENTS:**

- \* Definitely need to clear trees and shrubs near corners so you can see both ways without putting front of car into intersection. Need ordinance to prevent plants certain distance from intersection width of shrubs, ect.
- \* Make Jackson and Hamilton St. one-way north and south. Make 10th St. one-way 2 blocks one each side of Ave.
- \* Get the log trucks off Roanoke Avenue! Redesign intersection at Becker Drive and Old Farm Road - left turn lanes cannot see traffic coming from US 158.
- \* I would like more streets with curb and gutter. I know of several streets near me that have curb and gutter on one side of the street. How is this possible? I thought blocks had to sign petition and turn into city???
- \* Move logging trucks outside of downtown and uptown area - let Champion bear expense for this - their trucks are the ones causing congestion and wear and tear on city streets - public gets stuck with potholes!
- \* The key word is improve! For all sections, not just Becker Farms folks.
- \* Like to see Boiling Road and Fifth Street widened from US 158 to Roanoke Ave. Like to see 10th Street widened from Rapids to Avenue.
- \* 1) Please D/C 18-wheel trucks from Old Farm Road and 7th Street signs are posted but not heeded. 2) Construct Belt-Line around city. 3) Shorten length of traffic light holding time at 3 locations on 10th St., Becker Drive, US 158 and Walser's Corner.
- \* Get lights in sequence so traffic moves through instead of having to stop at each light. It looks as if the store owners controll the lights instead of the transportation dept. Enforce the turn signal law. Put this in the paper as a reminder to people. It looks as if they do not think or care.
- \* Ours is not a congested road but would strongly recommend widening Bolling Rd. or removing access of large trucks to that road.
- \* Start lottery help pay highway cost for N. C.

- \* Old Farm Road should have 45 mph all the way - from Park Ave. to Weldon Rd.
- \* Alternating routes on E. 10th Street, Weldon Road (from Weldon to Roanoke Rapids) and Roanoke Avenue.
- \* Keep signal lights together, keeps traffic flowing, but in Roanoke Rapids it's a major problem.
- \* Have never used transportation system in N.C.
- \* Worst Congestion: Fridays E. 10th, Walsers Corner to Jackson Street.
- \* Stop lights need adjustment for turning left coming west at the corner of Walser Moter.
- \* To want improvements - but not willing to pay - seems to have become the "American Way".
- \* I am very interested in improving Virginia Ave. The big truck transprotation is very bad.
- \* A local traffic bypass to keep local traffic off Weldon Rd. would help the congestion there and not hurt businesses on the road.
- \* All over town are intersections where bushes, trees, fences, etc. block the drivers view of on coming traffic at intersections. Most are in violation of city ordinances imposed on corner lots.
- \* Bus in bi-county to run every hour on hour for convenience of non-licensed persons and those without transportation.



**APPENDIX D**  
**RECOMMENDED SUBDIVISION ORDINANCES**

**DEFINITIONS:**

**I. Streets and Roads:**

**A. Rural Roads**

1. Principal Arterial - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.
2. Minor Arterial - A rural roadway joining cities and larger towns and providing intra-state and inter-county service at relatively high overall travel speeds with minimum interference to through movement.
3. Major Collector - a road which serves major intra-county travel corridors and traffic generators and provides access to the arterial system.
4. Minor Collector - A road which provides service to small local communities and traffic generators and provides access to the Major Collector System.
5. Local Road - A road which serves primarily to provide access to adjacent land, over relatively short distances.

**B. Urban Streets**

1. Major Thoroughfares - Major thoroughfares consist of Interstate, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.
2. Minor Thoroughfares - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through-traffic movements and may also serve abutting property.
3. Local Street - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

### C. Specific Type Rural or Urban Streets

1. Freeway - Divided multilane highway designed to carry large volumes of traffic at high speeds. A freeway provides for continuous flow of vehicles with no direct access to abutting property and with access to selected crossroads only by way of interchanges. (Design speed 70 mph, Operating speed 55 to 65 mph)
2. Secondary Freeway - A divided multilane roadway designed to carry moderate volumes of traffic at moderate speeds. The facility provides for the continuous flow of traffic thorough full control of access and the provision of interchanges or grade separation with no access at cross roads, and no traffic signals. (Design speed 50-55 mph, Operating speed 40-45 mph)
3. Parkway - A divided multilane roadway designed for noncommercial traffic, with full or partial control of access. Grade separations are provided at major intersections and there are no traffic signals.
4. Expressway - A divided multilane roadway designed to carry heavy volumes of traffic with full or partial control of access. Interchanges are provided at major intersections. There may be access to service roads and local streets, but there will be no signalized intersections.
5. Secondary Expressway - A divided multilane roadway designed to carry moderate volumes of traffic at moderate speeds. This facility may have partial control of access with right turn in and right turn out access to abutting property, and interchanges at major intersections. Some minor intersections may have traffic signal control.
6. Urban Arterial - Multilane roadway with signalized intersections, and access to abutting property. May have grass or barrier type median, or middle left turn lane.
7. Residential Collector Street - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.
8. Local Residential Street - Cul-de-sacs, loop streets less than 2,500 feet in length, or streets less than one mile in length that do not connect thoroughfares, or serve major traffic collectors, and do not collect traffic from more than 100 dwelling units.

9. Cul-de-sac - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.
10. Frontage Road - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.
11. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

## II. Property

- A. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.
- B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.
- C. Lot - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development of or both. The word "lot" includes the words "plat" and "parcel".

## III. Subdivision

- A. Subdivider - Any person, firm corporation or official agent thereof, who subdivides or develops any land deemed to be subdivision.
- B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or recombination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than ten acres where no street right-of-way dedication is involved, (3) widening or opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than two acres into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

- C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.
- D. Reservation - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

## DESIGN STANDARDS

### I. Streets and Roads

The design of all roads within Mocksville shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted by the town of Mocksville.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

- A. Right-of-way Widths - Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the Thoroughfare Plan.

1. Rural	Min. ROW
a. Principle Arterial	
Freeways	350 ft.
Other	200 ft.
b. Minor Arterial	100 ft.
c. Major Collector	100 ft.
d. Minor Collector	80 ft.
e. Local Road	60 ft.*
2. Urban	
a. Major Thoroughfare other than Freeway and Expressway	90 ft.
b. Minor Thoroughfare	70 ft.
c. Local Street	60 ft.*
d. Cal-de-sec	Variable**

The subdivider will only be required to dedicate a maximum of 100 feet of right-of-way. In cases where over 100 feet of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 100 feet. On all cases in which right-of-way is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width right-of-way, not less than sixty feet in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is subdivided, the remainder of the full required right-of-way shall be dedicated.

-----  
\* The desirable minimum right-of-way (ROW) is 60 ft. If curb and gutter is provided, 50 feet of ROW is adequate on local residential streets.

\*\* The ROW dimension will depend on radius used for vehicular turnaround. Distance from edge of pavement of turnaround to ROW should not be less than distance from edge of pavement to ROW on street approaching turnaround.

B. Street Widths - Widths for street and road classifications other than local shall be as recommended by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

1. Local Residential

Curb and Gutter section: 34 feet, face to face of curb  
Shoulder section: 20 feet to edge of pavement,  
6 foot shoulders

C. Geometric Characteristics - The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

1. Design Speed - The design speed for a roadway should be a minimum of 5 mph greater than the posted speed limit. The design speeds for various facilities shall be:

DESIGN SPEEDS			
Facility Type	<u>Design Speed</u>		
	Desirable	Minimum Level	Rolling
<b>RURAL</b>			
Minor Collector Roads	60	50	40
Local roads including Residential Collectors and Local Residential	50	50*	40*
<b>URBAN</b>			
Major Thoroughfares other than Freeway or Expressway	60	50	50
Minor Thoroughfares	60	50	40
Local Thoroughfares	40	40**	30**

\* Based on projected annual average daily traffic of 400-750. In cases where road will serve a limited area and small number of dwelling units, minimum design speeds can be reduced further.

\*\* Based on projected annual average daily traffic of 50-250.

## 2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

MAXIMUM VERTICAL GRADE		
Design Speed	Terrain	
	Level	Rolling
60	4	5
50	5	6
40	6	7
30		9

b. Minimum grade should not be less than 0.5%.

c. Grades for 100 feet each way from intersections (measured from edge of pavement) should not exceed 5%.

- d. For streets and roads with projected annual average daily traffic less than 250 vehicles and grades less than 500 feet long, values may be 150% of that shown in the above table.

3. Minimum Sight Distance - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters:

SIGHT DISTANCE				
Design Speed	30	40	50	60
Stopping Sight Distance				
Minimum (ft.)	200	275	400	525
Desirable Minimum (ft.)	200	325	475	650
Minimum K* Value for:				
Crest curve	30	80	160	310
Sag curve	40	70	110	160

(General practice calls for vertical curves to be multiples of 50 feet. Calculated lengths shall be rounded up in each case.)

-----  
\* K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in feet of the vertical curve which will provide the desired sight distance.

Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1990".

4. The "Superelevation Table" below shows the maximum degree of curve and related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter of 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

SUPERELEVATION TABLE			
Design Speed	Maximum e*	Minimum Radius ft.	Max. Deg. of Curve
30	0.04	302	19 00'
40	0.04	573	10 00'
50	0.04	955	6 00'
60	0.04	1,528	3 45'
30	0.06	273	21 00'
40	0.06	509	11 15'
50	0.06	849	6 45'
60	0.06	1,380	4 15'
30	0.08	252	22 45'
40	0.08	468	12 15'
50	0.08	764	7 30'
60	0.08	1,206	4 45'

e = rate of roadway superelevation, foot per foot

#### D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.
2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.
3. Off-set intersections are to be avoided. Intersections which cannot be aligned should be separated by a minimum length of 200 feet between survey centerlines.

#### E. Cul-de-sacs

Cul-de-sacs shall not be more than seven hundred (500) feet in length (for control of speed, visual detection of a dead end street, and for fire protection). The distance from the edge of pavement on the vehicular turnaround to the right-of-way line should not be less than the distance from the edge of pavement to right-of-

way line on the street approaching the turnaround. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street

#### F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purpose accept that this requirement may be waived where other definite and assured provisions are made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.
2. The width of an alley shall be at least twenty (20) feet.
3. Deadend alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turnaround facilities at the deadend as may be required by the Planning Board.

#### G. Permits for Connection to State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

#### H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 30 feet from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 6 feet from the face of curb.

#### I. Wheel Chair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

#### J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

a. Shoulder section approach

i. Under 800 ADT design year

Minimum 28 feet width face to face of parapets of rails or pavement width plus 10 feet, whichever is greater.

ii. 800 - 2000 ADT design year

Minimum 34 feet width face to face of parapets of rails or pavement width plus 12 feet, whichever is greater.

iii. Over 2000 ADT design year

Minimum width of 40 feet, desirable width of 44 feet width face to face of parapets or rails.

b. Curbs and gutter approach

i. Under 800 ADT design year

Minimum 24 feet face to face of curbs.

ii. Over 800 ADT design year

Width of approach pavement measured face to face of curbs.

Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be 1'6" minimum, or greater if sidewalks are required.

2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

a. Shoulder section approach - Width of approach pavement plus width of useable shoulders on the approach left and right. (Shoulder width 8' minimum, 10' desirable.)

b. Curb and gutter approach - Width of approach pavement measured face to face of curbs.

APPENDIX E  
STREET TABULATION

The Street Tabulation consists of an alphabetized street listing, with base year and future year traffic, and the recommended cross section for each street. Proposed facilities follow the listing of existing roadways.

Definitions

Capacity:	Capacity at Level of Service D
2020 ADT:	Average weekday traffic (2020) on existing system
2020 TP ADT:	Average weekday traffic (2020) on Thoroughfare Plan system
3 ln	Three lane roadway
5 ln	Five lane roadway
4 dv	Four lane divided roadway
2 lnp	Two lane roadway plus parking lane
adeq	Adequate
N/A	Not applicable

STREET - SECTION REFERENCE	LENTH	EXIST CROSS SEC.	EXIST ROW	PRACT. CAPACITY	1990 ADT	2020 ADT	RECOMMENDED CROSS-SECTION	2020 TP ADT
NC 46								
SR 1210 - WCL GASTON	0.69	24 (2 ln)	60	12,000	5,500	14,200	Adeq	14,200
WCL GASTON - I 95	3.97	24 (2 ln)	100	12,000	6,500	15,700		11,200
NC 48								
CLARK ST. - NC 46	0.76	48 (2 ln)	100	12,000	2,800		Mult. Ln C&G	
NC 46 - WASH. ST.	1.89	28 (2 ln)	100	12,000	8,000	19,200	Mult. Ln C&G	25,473
WASH. ST. - WELDON RD.	1.95	52 (2 lnp)	60	12,000	8,500	11,000	Adeq	16,260
WELDON RD. - US 158	0.63	44 (2 ln)	60	12,000	7,100	8,400	Adeq	9,100
US 158 - SR 1433	3.15	24 (2 ln)	60	13,000	6,500	10,800	Adeq	13,200
US 158								
SR 1460 - NC 125	4.73	24 (2 ln)	100	13,000	7,100	22,000	Bypass	12,800
NC 125 - THEATRE ST.	0.25	64 (4 ln)	270	20,000	13,400	21,400	Bypass	14,300
THEATRE ST. - I 95	0.76	84 (7 ln)	130	34,000	34,500	50,000	Bypass	36,100
I 95 - THIRD ST.	1.51	64 (5 ln)	100	24,000	15,300	29,100	Bypass	17,900
SECOND & THIRD ST. - US 301	0.76	44 (2 ln)	60	14,000	5,500	13,000	Bypass	8,000
US 301 - SR 1239	1.89	24 (2 ln)	180	13,000	10,500	25,600	Bypass	11,800
US 301								
SR 1622 - SR 1651	2.02	24 (2 ln)	100	12,000	3,900	10,800	Adeq	3,400
SR 1651 - SYCAMORE ST.	1.83	24 (2 ln)	200	12,000	2,200	5,200	Adeq	2,500
SYCAMORE ST. - SCL GARYSBURG	1.51	24 (2 ln)	60	12,000	10,500	25,600	Bypass	11,800
NC 125								
SR 1621 - SR 1686	5.68	24 (2 ln)	60	11,000	4,500	13,100	5ln	14,500
SR 1686 - SR 1629	0.51	64 (4 ln)	60	20,000	10,600	16,200	Adeq	18,900
SR 1629 - ROANOKE AVE.	1.77	52 (4 ln)	80	20,000	17,800	27,100	None	30,000
I 95								
SR 1202 - US 158	3.79	48 (4 ln)	260	54,000	33,600	79,500	Adeq	77,900
US 158 - QUANKEY CK.	4.55	48 (4 ln)	420	54,000	27,400	64,300	Adeq	66,800
SR 1600								
SR 1641 - SR 1671	3.28	20 (2 ln)	60	11,000	1,000	1,200	Adeq	1,300
SR 1651								
US 158 W - WELDON SCL	0.57	38 (2 ln)	60	9,500	1,780	3,030	Adeq	3,500

STREET - SECTION REFERENCE	LENTH	EXIST CROSS SEC.	EXIST ROW	PRACT. CAPACITY	1990 ADT	2020 ADT	RECOMMENDED CROSS-SECTION	2020 TP ADT
SR 1686								
NC 48 - NC 125	1.07	22 (2 ln)	60	11,500	4,700	8,900	Adeq	9,300
SR 1434								
SR 1429 - NC 48	3.41	20 (2 ln)	60	11,000	1,400	3,500	Adeq	3,200
SR 1400								
SR 1425 - SR 1426	2.53	22 (2 ln)	60	12,000	2,800	6,400	Adeq	6,600
SR 1426 - WCL ROAN R	1.01	20 (2 ln)	60	11,000	3,200	6,800	Adeq	6,900
WCL ROAN R - RAPIDS ST.	0.63	52 (4 ln)	60	20,000	4,880	8,940	Adeq	9,020
SR 1426								
SR 1434 - WCL ROAN R	3.35	20 (2 ln)	60	9,000	2,500	7,200	Adeq	7,700
WCL ROAN R - NC 48	1.26	24 (2 ln)	60	9,000	4,900	6,500	Adeq	6,300
OLD FARM RD.								
NC 125 - US 158	0.88	64 (5 ln)	N/A	24,000	3,000	7,700	Adeq	7,330
US 158 - BECKER DR.	0.42	48 (4 ln)	60	18,000	11,000	18,500	Adeq	12,840
BECKER DR. - VIRGINIA AVE.	2.27			12,000	5,800	11,300	Adeq	13,100
SR 1641 (Country Club Rd.)								
US 158 - SCL WELDON	1.77	24 (2 ln)	60	12,500	5,200	8,900	Adeq	4,800
SCL WELDON - SR 1657	0.50	24 (2 ln)	60	12,500	3,400	5,700	Adeq	1,000
EXT. SCL WELDON - US 301	0.44	24 (2 ln)	N/A	12,000	N/A	N/A	K	1,900
EXT. US 158 - EXT. BECKER DR.	0.25	24 (2 ln)	N/A	12,000	N/A	N/A	K	10,600
MARSHALL ST.								
WELDON RD. - 13TH ST.	0.35	32 (2 ln)	60	12,000	2,600	3,100	Adeq	2,900
13TH ST. - 6TH ST.	0.35	32 (2 ln)	60	12,000	1,000	1,400	Adeq	1,200
BECKER DR.								
10TH ST/NC 125 - OLD FARM RD.	0.50	44 (3 ln)	80	12,000	6,100	9,500	Adeq	13,000
EXT. FROM OLD FARM - SR 1710	0.89	24 (2 ln)	N/A	11,500	N/A	N/A	Adeq	10,600
SR 1710								
RR - US 158	0.13	24 (2 ln)	60	12,000	3,100	5,100	Adeq	7,200
SR 1629 (WELDON RD.)								
US 158 - NC 125/10TH ST.	0.13	48 (3 ln)	60	20,000	13,400	15,400	Adeq	14,200
NC 125 - NC 48	1.26	24 (2 ln)	60	12,000	10,200	11,500	Adeq	9,800

STREET - SECTION REFERENCE	LENTH	EXIST CROSS SEC.	EXIST ROW	PRACT. CAPACITY	1990 ADT	2020 ADT	RECOMMENDED CROSS-SECTION	2020 TP ADT
SR 1453								
NC 48 - HINSON ST.	0.72	20 (2 ln)	60	9,500	3,300	4,500	Adeq	4,100
HINSON ST. -								
SR 1400 - BRANCH AVE.	0.50	20 (2 ln)	100	9,500	2,000	2,800	Adeq	2,400
SR 1683								
NC 125 - NC 48	1.52	20 (2 ln)	60	13,000	1,100	4,500	Adeq	1,500
GEORGIA AVE.								
US 158 - WELDON RD.	0.34	32 (2 ln)	60	12,000	1,000	2,900	Adeq	2,900
WELDON RD. - DRAKE ST.	0.08	32 (2 ln)	60	12,000	1,500	1,000	Adeq	700
DRAKE ST. - 10TH ST.	0.51	20 (2 ln)	60	12,000	1,500	1,000	Adeq	700
PARK AVE.								
MARSHALL ST. - 10TH ST.	0.50	22 (2 ln)	60	11,000	1,800	3,300	Adeq	2,800
10TH ST. - OLD FARM RD.	0.38	32 (2 ln)	60	11,000	3,500	3,750	Adeq	3,750
THIRTEENTH ST.								
S FRANKLIN ST. - MARSHALL ST.	0.76	32 (2 lnp)	60	12,000	500	4,000	Adeq	3,300
VANCE ST.								
ELEVENTH ST. - S FRANKLIN ST.	0.38	32 (2 ln)	60	12,000	2,100	4,700	Adeq	4,200
JACKSON ST.								
FIRST ST. - 11TH ST.	1.26	32 (2 lnp)	60	12,000	2,300	5,700	Adeq	5,700
11TH ST. - ROANOKE AVE.	0.13	40 (2 lnp)	60	12,000	2,300	5,700	Adeq	5,700
HAMILTON ST.								
WASHINGTON ST. - 6TH ST.	0.82	32 (2 ln)	60	12,000	4,200	7,100	Adeq	8,200
6TH ST. - 9TH ST.	0.38	32 (2 lnp)	60	12,000	3,800	8,700	Adeq	7,300
9TH ST. - 13TH ST.	0.38	32 (2 ln)	60	12,000	1,200	1,400	Adeq	1,400
WASHINGTON ST.								
NC 48 - 13TH ST.	1.70	32 (2 ln)	60	12,000	3,800	6,200	Adeq	7,400
FIRST ST.								
JACKSON ST. - WASHINGTON ST.	0.25	32 (2 ln)	60	12,000	600	3,100	Adeq	3,100

STREET - SECTION REFERENCE	LENTH	EXIST CROSS SEC.	EXIST ROW	PRACT. CAPACITY	1990 ADT	2020 ADT	RECOMMENDED CROSS-SECTION	2020 TP ADT
FIFTH ST.								
ROANOKE AVE. - HAMILTON ST.	0.06	36 (2 lnp)	60	12,000	1,000	1,400	Adeq	900
HAMILTON ST. - CAROLINA ST.	0.38	32 (2 ln)	60	12,000	1,000	1,400	Adeq	900
CAROLINA ST.								
5TH ST. - 10TH ST.	0.63	32 (2 ln)	60	12,000	1,000	1,300	Adeq	2,600



## TYPICAL CROSS SECTIONS

Typical cross sections recommended by the Statewide Planning Group are shown in the following diagrams of Figure .

Cross section "A" is illustrative for controlled access freeways. The 46 foot grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Slopes of 8:1 into 3 foot drainage ditches are desirable for traffic safety. Right-of-way requirements would typically vary upward from 250 feet depending upon cut and fill requirements.

Cross section "B" is typical for four lane divided highways in rural areas which may have only partial or no control of access. The minimum median width for this cross section is 30 feet, but a wider median is desirable. Design requirements for slopes and drainage would be similar to cross section "A", but there may be some variation from this depending upon right-of-way constraints.

Cross section "C", seven lane urban, and cross section "D", five lane urban, are typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

Cross sections "E" and "F" are used on major thoroughfares where left turns are anticipated as a result of abutting development or frequent street intersections.

Cross section "G" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 24 feet is recommended with 30 feet being desirable.

Typical cross section "H" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections.

Thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "I". Cross section "J" and "K" are usually recommended for minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more concentrated development.

Cross section "L" is used in rural areas or for staged construction of a wider multilane cross section. On some thoroughfares projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time.

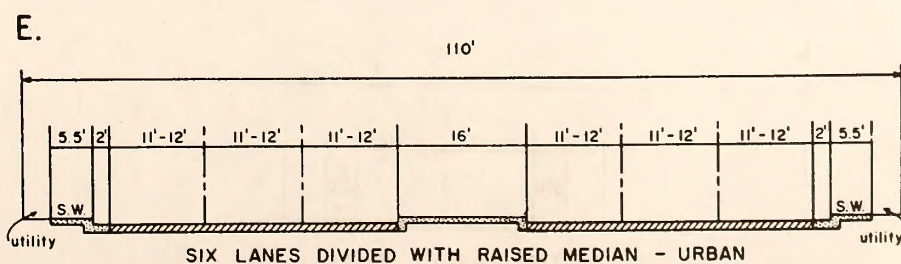
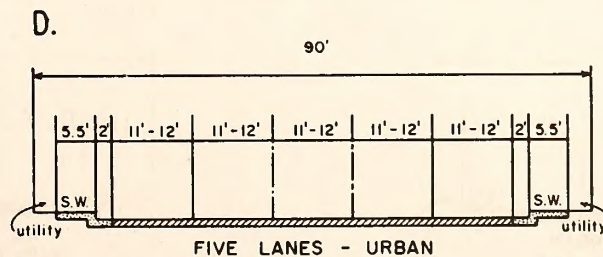
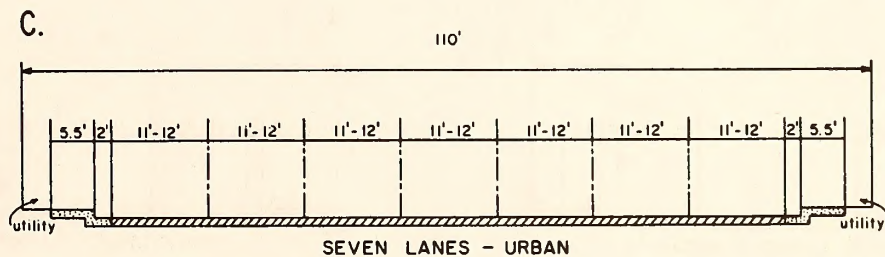
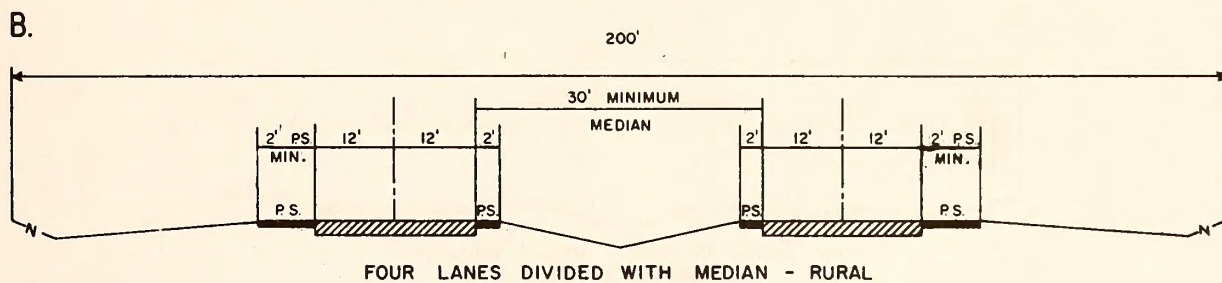
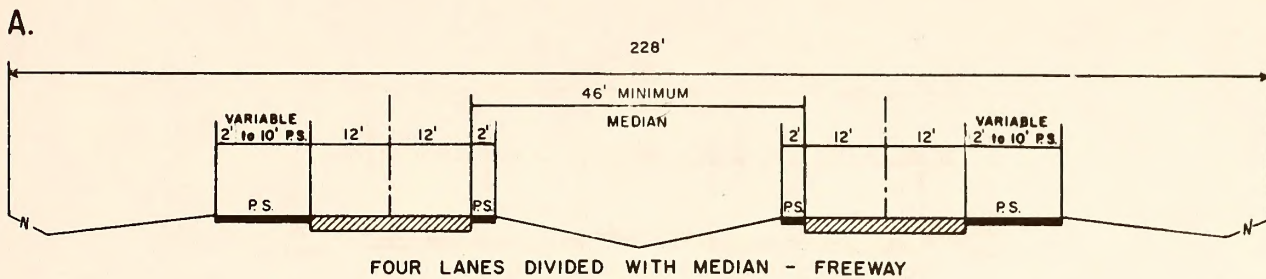
The curb and gutter urban cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk further away from the street to provide added separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

Right-of-way shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

If there is sufficient bicycle facilities, The North Carolina Bicycle Facility and Program Handbook should be consulted for design standards for bicycle facilities.

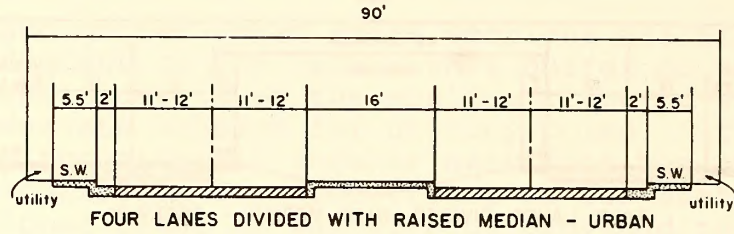
Recommended typical cross sections for thoroughfares were derived on the basis of projected traffic, existing capacities, desirable levels of service, and available right-of-way.

# TYPICAL THOROUGHFARE CROSS SECTIONS

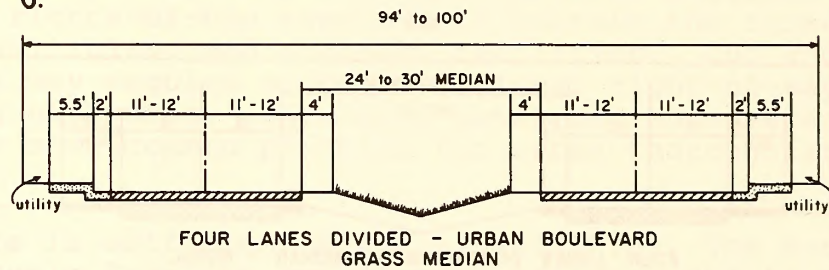


# TYPICAL THOROUGHFARE CROSS SECTIONS (CONTINUED)

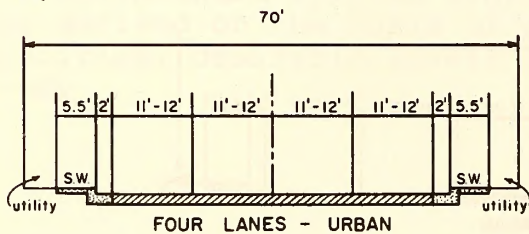
F.



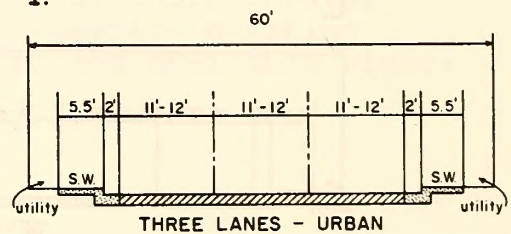
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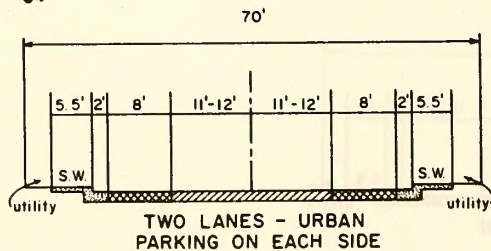
H.



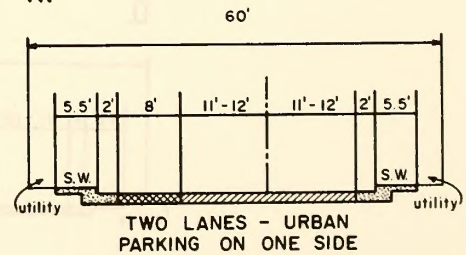
I.



J.



K.



L.

